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Original Articles

AFTER-TREATMENT OF LAPAROTOMY.*

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Every surgical operation depends for its success upon the observance of surgical principles which are generally understood. The operative technic of the leading surgeons is familiar to every one who has taken the pains to visit their clinics. The apparent variation in the methods pursued by the various surgeons as they go about their work largely disappears on closer inspection. Though it be true that everything which occurs in the operating amphitheater is largely standardized and more or less a matter of common knowledge to all who care to know, the details of the subsequent management of the cases are for a number of reasons much less familiar to the average medical observer. Everyone readily concedes that the postoperative management of abdominal operations is highly important, yet inquiry reveals the fact that this question is one upon which there is a division of thought in many particulars.

One successful surgeon gets his patients out of bed in two or three days, and another equally successful surgeon keeps his patients in bed two or three weeks, and both surgeons express themselves as well satisfied with their results. Are they both too easily satisfied? Or do both overestimate the importance of the amount of time in bed?

Having in mind the divergent views incident to this subject upon which our knowledge is advancing, I thought it worth while to undertake a systematic inquiry into a few particulars of the after-treatment of abdominal operations. I limited my questionary to six details, choosing those details which would in some degree in the average case probably be dealt with in a routine manner.

Accordingly I sent the following questionaire to one hundred surgeons of known ability and of wide geographical distribution:

"What is your routine treatment following laparotomy, in the following particulars?

"1. Anodynes.
"2. Stimulants.
"3. Nourishment.
"4. Cathartics.
"5. Recumbent position.
"6. Removal of stitches."

In view of the fact that the value of this symposium depends entirely upon the standing of its contributors, their names are published in this article.

It will be observed that they are not all members of some one special society, and that collectively they are well qualified to voice the best surgical opinion of America.

Sixty-six of the seventy replies received are incorporated in this analysis, and it is well to state again that exceptional conditions were not contemplated in this investigation.

A few of the replies were somewhat obscure on one or more points, which accounts for the variation in the number of answers tabulated.

The following is a list of the sixty-six physicians whose replies are given under the six different questions:

Thomas A. Ashby	Baltimore, Md.
W. Wayne Babcock	Philadelphia, Pa.
Edward A. Balloch	Washington, D. C.
J. W. Bovee	Washington, D. C.
S. C. Beede	David City, Neb.
H. T. Byford	Chicago, Ill.
J. Y. Brown	St. Louis, Mo.
J. N. Baker	Montgomery, Ala.
Carl Beck	Chicago, Ill.
J. H. Carstens	Detroit, Mich.
A. J. Coley	Oklahoma City, Okla.
Thomas S. Cullen	Baltimore, Md.
John B. Deaver	Philadelphia, Pa.
Robert L. Dickinson	Brooklyn, N. Y.
F. H. Davenport	Boston, Mass.
Edward J. Doering	Chicago, Ill.
George G. Eitel	Minneapolis, Minn.

*Read before the Chicago Academy of Surgery and the Livingston County Medical Society.

James B. Eagleson.....Seattle, Wash.
John F. Erdmann.....New York, N. Y.
J. Rilus Eastman.....Indianapolis, Ind.
H. D. Fry.....Washington, D. C
Jacob Geiger.....St. Joseph, Mo.
S. C. Gordon.....Portland, Me.
George Gellhorn.....St. Louis, Mo.
Howard Hill.....Kansas City, Mo.
H. E. Hayd.....Buffalo, N. Y.
William M. Harsha.....Chicago, Ill.
William H. Humiston.....Cleveland, Ohio
O. P. Humpstone.....Brooklyn, N. Y.
Edward J. Ill.....Newark, N. J.
Ernest Jonas.....St. Louis, Mo.
Jabez N. Jackson.....Kansas City, Mo.
Howard A. Kelly.....Baltimore, Md.
Charles D. Lockwood.....Pasadena, Cal.
H. W. Longyear.....Detroit, Mich.
Henry F. Lewis.....Chicago, Ill.
Howard Lilienthal.....New York, N. Y.
H. S. McKay.....St. Louis, Mo.
J. E. Moore.....Minneapolis, Minn.
W. P. Manton.....Detroit, Mich.
C. H. Mayo.....Rochester, Minn.
H. O. Marcy.....Boston, Mass.
E. E. Montgomery.....Philadelphia, Pa.
Stuart McGuire.....Richmond, Va.
F. S. Newell.....Boston, Mass.
Alexander Primrose.....Toronto, Can.
Charles A. Powers.....Denver, Colo.
John O. Polak.....Brooklyn, N. Y.
Miles F. Porter.....Fort Wayne, Ind.
C. E. Ruth.....Des Moines, Iowa
J. P. Runyan.....Little Rock, Ark.
Emmet Rixford.....San Francisco, Cal.
J. L. Rothrock.....St. Paul, Minn.
J. Knox Simpson.....Jacksonville, Fla.
Richard R. Smith.....Grand Rapids, Mich.
Charles L. Scudder.....Boston, Mass.
Ernest Sachs.....St. Louis, Mo.
Parkers Syms.....New York, N. Y.
George R. White.....Savannah, Ga.
C. H. Wallace.....St. Joseph, Mo.
H. Wellington Yates.....Detroit, Mich.
R. C. Coffey.....Portland, Ore.
William Jepson.....Sioux City, Iowa
William H. Magee.....Duluth, Minn.
I. Olmsted.....Ottawa, Can.
T. C. Witherspoon.....Helena, Mont.

1. ANODYNES.

Dr. Ashby: I use as little as possible.

Dr. Babcock: Except in very toxic cases or in patients with deficient elimination, we endeavor to make patients comfortable by the use of anodynes for the first twenty-four hours after operation.

Dr. Baker: I use them cautiously to allay pain or restlessness.

Dr. Balloch: Just as little as possible. For the night after operation I generally precribe a suppository containing a half grain of codein with five or more grains of veronal. This is usually sufficient, but if the pain is severe I see no good reason for withholding morphia. A great deal depends upon the nurse. Some will carry patients along with very little in the way of anodynes, while others want to resort to morphia at every opportunity.

Dr. Beck: Not as a routine, but given after kidneys begin working; freely, if bowels are active.

Dr. Beede: Usually not needed. Used freely in small doses if suffering is severe—morphin or heroin.

Dr. Bovee: Usually give morphin sulphate, gr. ¼, hypodermically at end of operation, and heroin as indicated afterwards.

Dr. Brown: Not unless there are special indications.

Dr. Byford: None after unless for severe pain. Usually give gr. ¼ morphin with gr. 1/150 atropin three-quarters of hour before operation, and this prevents pains during first few hours.

Dr. Carstens: I give an anodyne as soon as the patient gets restless after an operation; I give ⅛ gr. morphin and 1/120 of atropin. This makes the patients sleep. If necessary, I repeat that in three or four hours. I keep them quiet. In the evening, about nine o'clock, I double the dose of morphin and if necessary during the night repeat it. While they are sleeping, the ether is eliminated. If they are dry, which is seldom the case, I let them drink water, cold or hot, or tea or coffee, an ounce at a time frequently repeated.

Dr. Coffey: I give codein in ½ gr. doses, as necessary to make pain tolerable; occasionally morphin.

Dr. Coley: A small dose of morphin and atropin beforehand, when indicated.

Dr. Cullen: All abdominal cases—in fact every case where there is liable to be much pain after operation—are given ¼ grain morphia before they leave the table and sufficient morphia to make them comfortable for 24 or 48 hours, as may be deemed necessary. I never use less than ¼ gr. A smaller amount keeps the patient restless or slightly stupefied. After 24 or 48 hours morphia is cut off absolutely and they receive no more during their sojourn in the hospital.

Dr. Davenport: Morphin the day of operation; if severe pain, salt solution enema.

Dr. Deaver: Exceptionally only.

Dr. Dickinson: Routine order for hypodermics of morphin p. r. n. for the first 24 hours.

Dr. Doering: None, except as required for severe pains. In cases I have personally watched, I give hypodermics of ¼ gr. morphin sulphate plus 1/200 gr atropin before operation.

Dr. Eagleson: I believe that anodynes given in sufficient quantity to relieve pain during first 24 hours both lessen the shock and hasten convalescence.

Dr. Eastman: One or two suppositories containing 2 grs. of codein sulphate (Albany Chemical Company) are usually given during the first 48 hours following operation. Morphia gr. ⅛ hypodermatically is administered in selected cases.

Dr. Eitel: Usually one-half hour before ether is started we administer hypodermically morphin sulphate gr. ¼ and atropin gr. 1/100, and, if necessary, on account of pain, repeat the same once or twice during the first 24 hours.

Dr. Erdmann: One-sixth gr. morphia as the patient begins to "come out" and ⅛ in one-half hour after, if necessary. Sufficient anodynes to give comfort for 24 hours following.

Dr. Fry: Hypodermically, heroin gr. 1/16 to 1/12 or morphia gr. ⅛ to ¼ with atropia gr. 1/150.

Dr. Geiger: Small dose of morphia and atropin.

Dr. Gellhorn: Morphia 1/6 hypodermically for wound pain only in the first 20 hours after operation; asafetida enema for gas pains whenever necessary.

Dr. Gordon: I give anodynes to relieve pain.

Dr. Harsha: Heroin, and bromides if patient is not depressed too much.

Dr. Hill: We usually relieve the pain to a reasonable extent, preferring, however, not to give more than two hypodermics the day of operation, trying to tide the patient through the next day and until night by other means and usually giving no more morphin after the end of the second day. Unusual cases require more, but our intention is to keep to the point mentioned.

Dr. Hayd: I give none, if possible, and very seldom in recent years have I given more than ⅙ of morphin twice after any laparotomy.

Dr. Humiston: As a routine, a rectal suppository of codein, grs. 1½ the first ten hours following laparotomy.

Dr. Humpstone: Anodynes are avoided as much as possible.

Dr. Ill: Rarely give any except in restless patients. Crile's method has improved matters.

Dr. Jackson: Every patient following operation has a hypodermic of ¼ gr. of morphin given as soon as recovered from anesthetic sufficiently to suffer pain. Morphia is repeated as required sufficiently to prevent excessive pain during the first 24 hours, after which it is rarely needed. This routine is not only humane, but in every way beneficial and with no objection that I have been able to discover.

Dr. Jepson: We avoid the use in so far as possible, but nevertheless their use becomes frequently necessary during first 24 hours.

Dr. Jonas: If necessary morphia 1/6 gr. or narcophin ½ gr. on the day of operation.

Dr. Kelly: By order only. Generally morphia sulphate gr. 1/6 once or twice in first 24 hours.

Dr. Lewis: Morphin p. r. n. for severe pain only.

Dr. Lilienthal: If needed. No routine.

Dr. Lockwood: Codein ½ to 1 gr. or morphin gr. ¼. I use much less since adopting anoci-association.

Dr. Longyear: Usually a hypo or two of morphia gr. ⅛ and afterwards heroin gr. 1/12 a hypo. As little as possible, however.

Dr. Manton: Anodynes. Codein phosphate, gr. 1, hypo. p. r. n. for pain or restlessness. Only in rare instances when suffering is very great or patient is noisy, and so forth, morphin sulphate, gr. ¼, possibly repeated two or three times.

Dr. Magee: Morphin sulphate, gr. ½ hypodermically to allay pain.

Dr. Marcy: The minimum use of hypodermics of morphia and strychnia, occasionally opium by rectum.

Dr. Moore: One-quarter gr. morphia with atropin one hour before anesthetic. After the operation it is given in exceptional cases under positive indications.

Dr. Montgomery: If the patient is fairly comfortable, I do not give any. If, however, her discomfort is such as to keep her from resting, I give her a hypodermic injection of morphin ¼ to 1/6 gr. the night following the operation, and unless some complication develops no further hypodermic injection is given. The second night I sometimes give an enema of deodorized tincture of opium, 4 minims, tincture of valerian, ½ ounce, salt solution 2 ounces. The advantage of this mixture is that if the patient subsequently desires it repeated it can be done leaving out the opium.

The Mayos: We give morphin the first day following laparotomies, if the pain is severe. After the first day we try to get along with codein in place of morphin where it is possible, but have no objection to giving on occasional dose of morphin for three or four days in severe cases.

Dr. McGuire: Small doses of morphia or atropia hypodermically; repeated as indicated.

Dr. McKay: Morphia sulphate hypodermically first 24 hours for pain and restlessness, when necessary.

Dr. Newell: Morphin as necessary to control pain.

Dr. Olmsted: Morphin for first 24 hours, if necessary.

Dr. Polak: Morphia just before anesthesia and again after reaction; then carried along with scopolamin, gr. 1/400.

Dr. Powers: Practically nothing; if necessary, codein or a little morphia.

Dr. Porter: Usually they are not required, but are given, if needed, to secure the quiet and comfort of the patient.

Dr. Primrose: When necessary to relieve pain, if the cause of the pain cannot otherwise be removed.

Dr. Rixford: If pain is severe, I do not hesitate to give sufficient opiates to control it. If there is much nausea I prefer heroin to morphin. If there is great restlessness I often give chloral or bromides with or without a moderate dose of deodorized tincture of opium by rectum, which makes the first night after operation much more tolerable. Chloral, of course, omitted if there is much cardiac depression. Barring nausea, I do not know that I have ever seen any untoward effects from the use of anodynes after laparotomy given with reason.

Dr. Rothrock: Morphin in small doses the first 24 or 48 hours if much pain.

Dr. Runyan: Give ⅙ morphia and 1/150 atropin when necessary to relieve pain during first 24 hours. Always precede operation by ¼ gr. morphin and 1/150 atropin hypodermically.

Dr. Ruth: Very little, if any, 1/12 gr. heroin hypodermically only.

Dr. Sachs: Aspirin, at times morphin sufficient to keep the patient comfortable, usually one dose is all that is necessary.

Dr. Scudder: Morphia or codein immediately after operation unless contraindicated.

Dr. Simpson: I have no routine. I give morphin sulphate in doses of 1/6 gr., when necessary for pain, and prefer to have the ill effects of morphin rather than those from nights of restless suffering. I suppose a fairly accurate guess would be that one hypodermic of the above amount is given the first night in 75 per cent. of my cases, the remaining 25 per cent. receiving none.

Dr. Smith: Codein, grs. 1 to 1½ hypodermatically p. r. n., seldom more than three or four doses altogether; morphin, gr. ¼, if codein fails. (Rarely used.)

Dr. Syms: None.

Dr. Wallace: Morphin, gr. ⅙, and repeated a second time if needed.

Dr. White: Used freely for pain if required.

Dr. Witherspoon: I find no contraindication usually to the use of an anodyne. I prefer codein phosphate hypodermically, one to two grs. with possibly a repetition where the pain is severe. I see no contraindication to ¼ gr. of morphin under like conditions.

Dr. Yates: Limit them to the least possible degree and when given use codein subcutaneously.

It will be observed from the quotations given that definite fixed rules are not in evidence. However, a careful reading of all the communications permits the following tabulation:

Analysis of Replies on the Use of Anodynes.

Anodynes—		
None	20	65
Sparingly	35	
Freely	10	
Morphin	32	66
Codein	15	
Heroin	4	
Veronal	1	
Bromides	11	
Scopolamin	1	
Aspirin	1	
Chloral	1	

In listing twenty as giving "none" it must not be understood that twenty of the sixty-six absolutely withhold anodynes regardless of conditions. What is aimed at in this study is an approximate routine for the average case in the absence of special indications. The list of drugs is based upon the number of times the particular drugs were mentioned. Some of the replies name two or three drugs, and others none at all. It is worthy of note that the use of anodynes is largely limited to the first 24 hours following operation.

2. STIMULANTS.

None	62	65
Routine (?)	3	
Drugs—		
Strychnine	16	43
Digitalis	7	
Whiskey	6	
Camphorated Oil	5	
Coffee	4	
Caffeine	1	
Adrenalin	1	
Eserine	1	
Glucose	1	
Alkalis	1	
Salt Solution—		
Per rectum	8	
Subcutaneously	8	
Tap Water—		
Per rectum	8	

It is apparent at once that the routine administration of stimulants has been abandoned—at least as far as drugs are concerned. Tap water or salt solution per rectum seems to be growing in favor.

3. NOURISHMENT.

Dr. Ashby: After 24 hours liquid diet, if digestive organs are in good condition.

Dr. Babcock: After simple abdominal sections, water or barley water given in small but increasing amount from the first. Soft diet is given as soon as the bowels have been thoroughly emptied. In septic patients we aim to give nothing by mouth until localization of the septic focus has occurred.

Dr. Balloch: No slops. I have given up altogether the use of broths and I regard albumin water as an invention of the devil. I wait until the patient becomes hungry, as a rule, and then give him what he wants to eat, if his demands are not too outrageous. In cases needing feeding from the start, I use some of the fermented milk preparations, or scraped beef, both of which I find that the stomach takes care of very well. I give solid food as soon as possible in some cases the day after operation, and in nearly all cases on the third day after operation. My patients do and feel much better than under the old routine of liquid food for three days, etc.

Dr. Bovee: Hot water *ad libitum* from then until stomach is not rebellious, then cautiously albumin water and broths, and buttermilk for five days, then cereals, poached eggs, soft boiled eggs, etc., to seventh day and then nearly regular diet.

Dr. Byford: None, except plenty of water, during first 24 hours; small quantity of liquid food every three hours on second and third days. After that liquid diet and toast and butter in mild cases, eggs, cereals; at end of first week meat, eggs, toast, fruit for breakfast, etc.

Dr. Carstens: I give them liquids, chicken broth, egg albumin and plenty to drink. I have great trouble to have nurses understand giving water; they will give three or four ounces three or four times a day. This is the second and third day, when the effects of the saline have passed off. These patients need large quantities of water to eliminate effete material by

skin and by the kidneys; it fills up the blood vessels; give them a gallon or two, all you can get them to take.

Dr. Coffey: After gas has passed freely from bowels, usually on third day.

Dr. Erdmann: Water in first 12 to 24 hours; tea, albumin, broths. Twenty-four to 48 hours, milk, semi-solids; 48 to 72 hours, semi-solids to solids, except special work as gastric surgery, etc.

Dr. Gellhorn: Liquid nourishment day after operation; soft diet the following day, light on third, and full diet on fourth day.

Dr. Hill: Food is not needed until the end of the second day. As soon as the appetite returns we put the patient on good substantial food, so that we almost never give a liquid diet, but start at once on a so-called light diet, as I believe that when the appetite returns, if the operation has not been one on the stomach or intestines, that this is well tolerated, if not given in too great quantities.

Dr. Humiston: None for first 24 hours. Thin liquid broths and malted milk.

Dr. Cullen: The nourishment in nearly all abdominal cases consists of egg albumin for a few hours. Every patient is allowed as much water as they desire from the moment they wake up. As soon as the bowels move whether by enema or as a result of cathartics, the patient is put on soft diet. There is no doubt that a liquid diet tends to produce gas, consequently I replace the liquid by a soft diet at the earliest possible moment.

Dr. Davenport: None until nausea has ceased, then small quantities of albumin water, milk and lime water, if patient wishes, until bowels have moved.

Dr. Deaver: Nothing until commence to pass gas, then albumin water, beef tea, chicken broth, buttermilk, etc.

Dr. Doering: First day usually nothing, but water administered frequently second and third, liquid food, small quantity every two hours; later semi-solid diet.

Dr. Eastman: Ordinarly hot tea is allowed on the day following operation, liquid diet from the third to the sixth day, soft diet from the sixth to the ninth, and then house diet.

Dr. Jackson: Patients are allowed to have water freely, if desired, practically from the outset, and at the end of 24 hours, unless nauseated, which is rare, are permitted liquid nourishment freely. After the cathartic on the fourth day they are ordinarily allowed anything they want.

Dr. Jepson: This is administered after the first 24 hours, or as soon thereafter as the patient is inclined to accept it.

Dr. Kelly: Liquid diet begun in 24 hours unless drained or gastric cases.

Dr. Lilienthal: Liquid after 24 hours. No milk.

Dr. Longyear: Broth only for 3 days; soft diet for 6 days, no milk till after laxative.

Dr. Manton: Generally nothing by mouth for 24 hours, occasionally, if no disposition to vomit, sips hot water. Toast 24 hours, fluids, preferably hot, two ounces every 2 hours. No milk. Usually three to four days, light soft diet; full diet by end of week.

Dr. Marcy: Fluid food, small quantities given often.

Dr. Moore: Given freely as soon as patient's stomach will retain it.

Dr. Montgomery: Nothing but hot water until the patient is relieved of the nausea of the anesthetic. It this is prolonged, salt solution is given by rectal instillation. If the stomach is quiet a cup of tea or broth the evening of the operation. The following day, broth, poached egg, broth. After the third day a fairly generous diet.

The Mayós: Hot water the afternoon of the operation, an onuce at a time, gradually changing to cold water if nausea is not present. The patient is kept almost entirely upon liquids for three days. The fourth day castor oil, two ounces, as a routine. After a good result has been obtained from the cathartic, the patient is placed upon a semi-liquid diet for the first week, full diet from that time on, except in selected cases.

Dr. McGuire: Broths, buttermilk and albumin after first 24 hours; eggs, toast, ice cream after third day. Light diet after fifth and general diet after sixth day.

Dr. Polak: Water *ad libitum* after the first six hours; later cereals, with milk sugar.

Dr. Porter: This depends somewhat upon the character of the case. My rule is to give nothing but water until the patients feel the desire for food. These are first liquid, to be followed cautiously by more substantial things until an ordinary diet is given.

Dr. Primrose: As early as possible.

Dr. Rixford: Unless the patient is actually suffering from want of food, I give none until peristalsis is established or the passing of gas by rectum, which is generally on the second or third day, and then I begin with clear broth, consomme and albumin water, particularly avoiding milk. The second day I generally give gruel. On the third or fourth day I give solid food. If the patient is in great need of food from the beginning I give peptonized milk by rectum four ounces every four hours.

Dr. Ruth: None first 24 hours save water by proctoclysis, then usually grape juice, malted milk, and raw egg for two or three days.

Dr. Sachs: Nothing by mouth if the patient vomits. Then fluids, which are usually begun after 12 hours. Food, when there is no longer evidence of intestinal paresis, as shown by passage of gas.

Dr. Scudder: Influenced by gastric disturbance. Liquids for at least 24 hours, getting back to solid food as soon as possible.

Dr. Simpson: Liquid nourishment is given as soon as the post-anesthetic vomiting ceases, except in stomach cases, which get only hot water for 48 hours. Regular hospital diet is begun after the first cathartic. Soft diet is given in the majority of the cases on the fourth day.

Dr. White: Liquid nourishment day after operation; soft diet next day.

Dr. Yates: Liquid food for three days; then, if bowels have operated, full soft diet. After the fifth day in an uncomplicated case, full diet.

Analysis of Replies on Nourishment

Nourishment—

None first 24 hours	54	65
Yes first 24 hours	5	
None first 48 hours	6	

Limited to liquids first 24 hours	2	59
Limited to liquids first 48 hours	6	
Limited to liquids first 72 hours	51	

4. CATHARTICS.

Dr. Ashby: After 48 hours if necessary.

Dr. Babcock: Cathartics are never given by mouth until an evacuation has occurred by the use of enemas, after this an endeavor is made to secure a daily action either by laxative or enema.

Dr. Baker: Rarely used. An alum enema to empty large bowel of gas and to relieve discomfort.

Dr. Balloch: I seldom use them. Prefer to rely upon diet and enemas.

Dr. Beck: Third day castor oil.

Dr. Bovee: About fourth day eserine salicylate, and an enema for a stool.

Dr. Brown: Generally third day.

Dr. Byford: Glycerin enemas if called for during first two days; saline cathartic on third day or earlier if needed.

Dr. Carstens: I give an enema of four ounces of glycerin and four of water in about 48 to 72 hours, and occasionally after that repeat it. After that I give them a dose of cascara, as needed. I have them lying in any position they like. I give them several pillows or a head rest as soon as they want it.

Dr. Coffey: Give high comp. enema forty-eight hours after operation. Occasionally give cathartics by mouth after fifth day—never until bowels have emptied by use of enema.

Dr. Cullen: The variety of cathartics varies. Cascara is used by some. Calomel is rarely employed. Where we are the least bit afraid that intestinal obstruction will result, no cathartic is given. We rely entirely on enemata.

Dr. Deaver: No.

Dr. Doering: Enemas as required, saline laxative third morning.

Dr. Geiger: Castor oil; sometimes small dose of calomel.

Dr. Gellhorn: Castor oil, one ounce, forty-eight hours after operation; 72 hours after operation if appendix has been removed. Phenolphthalein, grains 2, every evening after bowels have moved. S. S. enema if needed.

Dr. Hill: With regard to cathartics, at present we never give them before operation, relying upon an enema to clear the bowels the morning of operation. I never give a cathartic for about six days after the operation.

Dr. Humiston: Third day; saline usually.

Dr. Humpstone: Not used.

Dr. Ill: Rarely before the fifth day, then magnesium sulphate.

Dr. Jackson: If suffering from gas in the early days this is relieved by enemata. On the fourth day all patients, or practically all, receive two ounces of castor oil. Thereafter cathartics are rare and only given as needed.

Dr. Jonas: Enema, glycerin, oil, 3 ounces on third day. If necessary, castor oil on fourth day.

Dr. Kelly: A B S and C in 48 hours.

Dr. Lilienthal: After say 4 to 8 days, but enemata if needed meantime. Much depends on character of disease and operation.

Dr. Manton: No cathartics before operation. Bowels usually moved by enema third day. Usually no cathartic for first week.

Dr. Moore: Second to fourth day, owing to circumstances.

The Mayos: No cathartics until after all drains have been removed. No cathartics in cases in which the intestines or stomach have been operated upon. In other cases, two ounces of castor oil on the morning of the fourth day as a routine.

Dr. McGuire: S. S. enema from first for gas. Gentle laxative like cascara or licorice powder second or third night.

Dr. Porter: Cathartics are used very sparingly. The rule is to pay no attention to the bowels as long as the patient is comfortable on this score. In the average case the bowels move with an enema and a proper diet. In the past I think cathartics have been abused in the latter treatment of laparotomy.

Dr. Primrose: Secure a daily movement of bowels after first 24 hours is usually indicated.

Dr. Rixford: I almost never use cathartics after operating, on the ground that they cause a disproportionate amount of suffering to the good they accomplish. If peristalsis is not reestablished without their aid they serve little purpose except to distend the still paralyzed parts of the bowel. If peristalsis is reestablished there is little object if any in giving them beyond evacuating the colon, and this can be better accomplished by means of enemata. If there is much distension I give frequent enemata containing asafetida or turpentine. I occasionally use atropin or if the heart is not depressed eserine for excessive meteorism.

Dr. Runyan: None given until third or fourth day. Castor oil or epsom salts to suit case of patient.

Dr. Ruth: Laxatives in pill form, magnesium sulphate (Squibb's) or enemas second or third day if needed, usually nothing is needed.

Dr. Sachs: No cathartic until intestinal paresis has disappeared, so that the patient practically never gets a cathartic before the third day.

Dr. Scudder: Rarely cathartics by mouth. Depend upon enemata very largely.

Dr. Simpson: For cathartics, castor oil is given from fourth to sixth day depending on case. No cathartic is given a drainage case until the tube is out.

Dr. Syms: None. Enemata.

Dr. Wallace: Castor oil as a rule at end of 48 hours.

Dr. Witherspoon: Cathartics are not used by me until bowel and stomach conditions are good, then preferably a mild and acid preparation, such as milk of magnesia.

Dr. Yates: I prefer castor oil given in beer the morning of the third day.

Cathartics: Analysis of Replies.

Cathartics—		
None by mouth	18	
During first 24 hours	1	
During second 24 hours	9	55
During third 24 hours	22	
Fourth day or later	5	
Drugs—		
Castor oil	12	
Salines	12	
Calomel	6	
Milk of magnesia	4	39
Cascara sagrada	3	
Pill A. N. & B. & C.	1	
Phenolphthalein	1	

5. RECUMBENT POSITION.

Dr. Ashby: Only when required.

Dr. Babcock: Except for some very special reason the recumbent position is not insisted upon. We prefer to turn the patient than to give anodynes for backache. The Fowler position is used after operations for intra-abdominal infection, and after operations upon the stomach. In simple appendectomy patients are permitted to sit up or get out of bed as soon as they desire to, provided the movement produces no discomfort. As far as is feasible, and excluding those patients who have grave infections, we like to combat the condition of being bed-fast by early massage and frequent changes of posture.

Dr. Balloch: I consult the feelings of the patient. If she feels that she would like to be propped up, I let her try it. I am not in any great hurry to get my patients out of bed. I find that a good rest out of operation does them good and they go home in better shape than after an early getting out of bed.

Dr. Beck: Recumbent position in case of operations on lower abdomen and drainage.

Dr. Bovee: Recumbent position only until stomach is quiet.

Dr. Byford: First week for benefit of abdominal incision. Back rest in bed second week, and out of bed early in second week.

Dr. Coffey: From ten to fourteen days after operation.

Dr. Coley: Recumbent position unless pus in pelvis, then Fowler's.

Dr. Cullen: In all bad appendix cases we drain and invariably place in Fowler's position immediately after operation. In simple cases where there is difficulty in voiding urine they are given a back rest within twenty-four to forty-eight hours.

Dr. Davenport: For ten to twelve days.

Dr. Eastman: The recumbent position is assumed until the tenth to fourteenth day.

Dr. Erdmann: Any old position that the patient obtains comfort in—even flat on the belly.

Dr. Gellhorn: Rest in bed for ten days; turn on side immediately after operation; out of bed on eleventh day; walking on twelfth day.

Dr. Gordon: Much depends on character of operation; as a rule, recumbent position for two weeks.

Dr. Hill: With regard to the time in bed, we have receded from our one time method of forcibly getting the patient up early, and at present leave our patients in bed at least seven days, generally ten. Other cases with drainage wounds are not allowed up until the wound practically closes.

Dr. Humiston: For ten days, changing positions every few hours.

Dr. Humpstone: Ten days for pelvic surgery.

Dr. Ill: Elevate the feet for twelve hours in all non-drainage cases. Elevate the head otherwise.

Dr. Jackson: I get all my patients up out of bed as early as practicable; simple appendectomies in twenty-four to forty-eight hours, and ordinary clean laparotomies on about the fourth day. The simple cases usually begin walking upon the third or fourth day, and larger cases are walking at the end of a week. Only infected cases are kept in bed longer.

Dr. Jepson: Except in septic cases, where it is desired to have the position of the patient aid the walling off of an infected area, patient may lie as he or she is disposed.

Dr. Jonas: Mostly Fowler position as soon as patient awakens from narcosis. Out of bed on seventh day.

Dr. Kelly: Yes.

Dr. Lewis: Not insisted upon; Fowler's if operation was for pus; sit up in bed third day, and in chair seventh day, if desired.

Dr. Lilienthal: Six days to three weeks, according to length and location of wound.

Dr. Lockwood: Ten days.

Dr. Longyear: Fourteen days.

Dr. Manton: Depends on nature and severity of operation; ten days to three weeks.

Dr. Marcy: Yes, important; occasionally the Fowler position.

The Mayos: All patients are placed in a recumbent position, except septic cases, which are placed in a Fowler position.

Dr. McGuire: Nine days for appendix (with drainage); fourteen days for a hernia; twenty-one days for median incision.

Dr. Olmsted: Yes, in all upper abdominal operations, and also in cases of peritonitis.

Dr. Polak: For first twenty-four hours; freedom of motion after; in roll chair on roof on fifth or sixth day.

Dr. Porter: In mid-line incisions in hernia and especially in incision above the umbilicus, I prefer to have my patients maintain a recumbent position for from ten days to two weeks. Patients that are reduced and

that have had an exploratory examination for carcinoma and old people are gotten up in a sitting posture within a few days.

Dr. Primrose: Usually, but Fowler's position in acute peritonitis requiring drainage; also in most gastroenterostomies.

Dr. Rixford: I think it is a great mistake to sit patients up too soon after any exhausting operation. Frequent change of position is more efficacious in preventing pulmonary stasis. I am very apt to permit the patient to take that position which he finds most comfortable. Partial flexion of the lumbar region relieves the tension on the abdominal wound. I keep all patients in bed, that is, in more or less recumbent position for two weeks, except in cases of hernia, which are kept recumbent for three weeks.

Dr. Scudder: Position most comfortable to patient. Fowler's position in septic peritonitis, semi-sitting position following stomach plastics.

Dr. Simpson: I do not insist upon the recumbent position. In clean cases I allow them to assume the most comfortable position. In drainage cases the position most favoring gravity drainage.

Dr. Smith: Back rest a few days after operation and during the first ten to fourteen days. After that up in a chair. Out of bed walking about two to two and one-half weeks after operation. This rule varies much according to circumstances.

Dr. White: Fowler's position after operation; sit up in bed tenth day.

Dr. Witherspoon: In most of my cases I prefer a mild Fowler in bed, the head being raised upon blocks six or eight inches high. I think this makes for comfort and helps peristalsis. Where drainage is necessary, the elevation of the head is increased considerably.

Dr. Yates: Keep them recumbent until third day, then permit head rest. Uncomplicated afebrile cases sit up in chair on seventh day. A bed was never made to sit up in.

Recumbent Position: Analysis of Replies.

Recumbent Position—		
For 3 days	2	
For 6 days	1	
For 7 days	5	
For 10 days	13	64
For 12 days	22	
For 14 days	8	
Up as soon as patient wishes sitting position	1	

Removal of Stitches: Analysis of Replies.

Stitches—		
Sustaining 7 days	1	
Sustaining 8 days	6	
Sustaining 9 days	2	
Sustaining 10 days	21	66
Sustaining 12 days	10	
Sustaining 14 days	13	
Absorbable only	13	

Keeping in mind the fact that the longer communications permitted the writers to set forth their views with greater emphasis than the short statements permitted, and yet not adhering strictly to deductions based absolutely upon numbers, a careful study of all of the sixty-six communications upon the question of routine after-treatment of abdominal operations justifies the following composite statements:

1. *Anodynes.* If the patient is fairly comfortable, do not give any; if the pain is severe, give morphin the first 24 hours following operation, and endeavor to be done with opiates by the end of the first 48 hours.

2. *Stimulants.* None.

3. *Nourishment.* Give only water during the first 24 hours, then liquids, except milk, for two days, follow by a light soft diet, increasing to general by the end of the first week.

4. *Cathartics.* After drains are out, and excepting stomach and intestinal operations administer a cathartic at the end of the third day.

5. *Recumbent Position.* Keep the patient in bed one or two weeks with frequent change of position.

6. *Stitches.* Remove the sustaining non-absorbable sutures toward the end of the second week.

TRAUMATIC HERNIA, AND ITS RELATION TO THE WORKMEN'S COMPENSATION ACT*

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"It is decidedly rare for a hernia to be formed suddenly," writes a modern authority. "Hernia is always of a slow formation, and very few persons are aware of its oncoming," says another observer, and a number of cases cited by various writers confirm these statements; while there are also other instances given in which injuries of different kinds resulted in the sudden appearance of a hernia.

We seem to lose sight of the fact that a blow which is sufficiently severe to produce a hernia, whether it be direct or indirect, would be apt to do violence to the other abdominal organs to prove fatal. Any intra-abdominal pressure sufficient to cause a tearing or separating of the abdominal wall, great enough for a hernia to appear, would give rise to the following symptoms which are those typical of a true traumatic hernia:

*Read before the Chicago Medical Society, Jan. 20, 1915.

History of a sudden onset, overlifting, or severe strain.
Shock varying in degree.
Patient seeks immediate medical aid.
Pain—Patient found in stooping posture.
Weakness, nausea and sometimes vomiting.
Impulse upon coughing, generally found high up in the canal.
Swelling varying in size, usually small.
Marked tenderness over entire area.

Note—The swelling does not appear when the patient assumes the upright position; but an impulse will be felt in canal when patient is instructed to cough.

If the hernia is irreducible, and the above symptoms are exaggerated, and coughing, and straining do not influence the tension in the hernial sac it is indicative of a strangulated hernia. In other words, a traumatic hernia complicated by strangulation.

I herewith submit to your examination and discussion a typical case of true traumatic hernia.

In my opinion, 98 per cent of all cases of hernia brought to our attention cannot be classed under the head of traumatic hernia, but are potential herniae and therefore do not come under the Workmen's Compensation Act.

While Pember and Nuzum, in their recent article on traumatic hernia, cite two cases in which a hernia appeared immediately after an accident, they also say in their conclusions:

"Traumatic hernia is not likely to be produced by a blow which is short of lethal, unless a puncture wound is produced."

Dr. J. P. Hoguet reported in 1911 a series of cases in which an inguinal hernia developed after appendectomy, the cause being an injury to one of the abdominal nerves. He says:

Altogether eight cases of right inguinal hernia were found in which there had been a history of an antecedent appendectomy, the time of appearance of the hernia varying, *the shortest one being two weeks after leaving the hospital, and the longest, four years.* The greater proportion occurred in those cases in which the appendix wound had been drained, and in which, of necessity, it was larger, with a greater chance of nerve injury, whether by directly cutting the nerve in doing the laparotomy or by the pressure on the latter by a drainage tube. (The italics are ours.)

Dr. Joseph Wiener, writing in November, 1910, on the cure of hernia, reported a case in which a hernia developed in the scar five months after an abdominal operation for the removal of diseased adnexa.

In another of his cases a hernia developed a year after an operation for appendicitis, the hernia in this case also occurring on the site of the scar.

Hernia results, in almost every instance, from the gradual stretching of tissue and escape of the abdominal contents, either into a preformed (congenital) sac, or by the formation of a sac (acquired) from the peritoneal lining of the abdomen. *A congenital sac* may have existed long before the protrusion of the hernia, by the persistence of a pouch of peritoneum (tunica vaginalis), which normally should have been obliterated at, or shortly after birth.

I wish here to call your attention to the descent of the testicle.

At the eighth month of intra-uterine life, we find the testicle leaves the abdominal cavity through the internal ring, pushing before it a process of peritoneum known as the processus vaginalis; that portion immediately surrounding the testicle being known as the tunica vaginalis testis. Normally this process becomes adherent around the testicle, cord and its structures, obliterating the canal, if you please, but we all know from our dissecting room experiences, it is not uncommon to find this canal still patent, closed only at the internal ring, or just above the testicle.

F. T. Fort, in his paper on inguinal hernia, expresses the opinion that nearly all, if not all, inguinal herniae are of congenital origin.

With regard to traumatic hernia, Dr. P. C. Pilon said in a recent article:

The subject of traumatic hernia is of the greatest importance to companies which employ railway labor, as there is seldom a time when the individual railway companies are not taking care of a score of so-called traumatic hernial cases among their employes and patrons.

The above writer says that traumatic hernia may occur in men without anatomic defect, "but at an unguarded moment, when the muscles surrounding the normal canal are relaxed, flabby, and without resistance to an additional intra-abdominal pressure."

Such hernia may result from a sudden strain,

or a fall or a crushing blow, even if a commencing hernia did not exist.

"Both legislation and medical literature recognize it, but it is undoubtedly a very rare occurrence."

Concerning the methods by which an old hernia may be recognized from a post-traumatic, recent one, Pilon says that the local evidences of external violence are shown by a sudden swelling, always of small size in traumatic hernia, varying from an almond to that of an egg. If scrotal, the hernia is an old one and difficult to reduce. Further, the traumatic hernia will be one-sided only. Ecchymosis may be present, though not of necessity. In traumatic hernia, also, the manifestations occur soon after the accident. Pilon adds:

If the result of trauma the symptoms are always acute. There is always much pain and local tenderness.

In fact, the German law lays great stress on the violence of the immediate symptoms in requiring that the injured must seek medical attention within 48 hours and that the physician at that time finds evidence of recent hernia. A patient who complains of a hernia several days after the accident, had a hernia before the accident occured.

If the hernia is of traumatic origin, on the operating table soon after the accident the sac will be found very thin, as of tissue severely distended, there will be no indurated or adherent omentum, and the ring of fibrous tissue found in old hernias will be absent; its presence will indicate that the hernia has existed for some time.

P. A. Bendixen, a railway surgeon, writing in 1911 on "Traumatic Hernia," said:

From a practical standpoint, we may group traumatic hernia into two classes, namely, true traumatic and accidental. The essential difference in these groups lies in the fact that in the true traumatic variety all parts of the hernia, the orifice of the sac, the sac itself, and the contents of the latter, are the direct result of external violence.

In the accidental hernia, on the other hand, the sac and its orifice being already in existence, the entrance of the intestine is brought about by the action of some force. (Lotheissen.)

The number of accidental hernias, or as Hansen calls them (force ruptures) is larger than the true traumatic variety.

Observations have been made in several foreign countries, and by different corporations in this country, showing a large number of claims for the alleged presence of traumatic hernia could be traced back to the fact that the hernial condition had been present for some time. It has been further shown in cases where a hernia developed from an alleged accident that the claimant did not undertake any more hazardous work on the day the accident occurred than he was in the habit of performing on previous days.

It is a well established fact that certain regions of the body are more predisposed to hernia than others, especially those regions where the abdominal structures are less resistant. Such weak places, of course, are present in every individual, but much more pronounced in some than in others.

Statistics have shown that most cases of accidental hernia are of the inguinal variety. Considering the anatomic structures of the abdomen we find that the inguinal canal is one of the weakest spots. The wider it is and the straighter its course, the more readily will a hernia develop. Then again, there may be some peculiar inherited shape of the abdomen, extreme mobility of the peritoneum, insufficient fixation or ptosis of the viscera, frequent sudden increase of the abdominal pressure, and when there is marked predisposition, a very slight accidental cause may be sufficient to produce a hernia. On the other hand, there may be no predisposing factor whatever, but a combination of accidental causes may be followed by the development of a hernia. There is at present a considerable amount of discussion as to whether a hernia can appear in all its component parts.

The majority of authors believe this is an extremely rare occurrence, although it is not uncommon to have patients state that the condition appeared suddenly while at work.

David Ross, in his recent article on "Hernia in Infancy and Childhood," quotes a statement from Colel to the effect that "surgeons are becoming more and more convinced that a large percentage of hernia of adult life is due to a preformed sac which has existed since birth." (For an exposition of this theory see the book by R. W. Murray noted in our bibliography.)

H. A. Moffat, in a paper on "Hernia and the Workmen's Compensation Act" (see *South African Medical Record* for June 8, 1912), says that when claims for compensation are made the following points will be helpful in estimating the influence of the alleged strain or trauma:

1. The previous history of the patient as to hernia, chronic cough, etc., and also the result of previous examinations.

2. The circumstances of the accident; whether caused by ordinary effort and normal work.

3. The immediate sequelae-amount of pain, incapacity, swelling and the reduction of the swelling.

4. The character of the hernia itself. If traumatic and recent, it will be quite small as well as painful and tender. If a hernia reappears at once when the patient stands up, it is not of a recent origin;

further, if the sac is found thickened after operation, the hernia is an old one.

5. The existence of other hernias and the character of the abdominal wall in general. Hernia is frequently a multiple condition, and it is not uncommon to find an inguinal hernia on one side and a large external abdominal ring and relaxed canal with an impulse high in the canal on coughing on the other side.

6. The existence of marks left by wearing of truss.

If the Court judges the hernia to be an accident under the Workmen's Compensation Act, then two other points must be considered, namely, the amount of incapacity and the treatment.

There is a diversity of opinion among modern writers as to the production of a hernia. While some observers, as we have shown above, believe that traumatic hernia is sometimes caused by blows or falls, without any predisposing cause, other writers express the opposite view.

W. B. Outten, in his article on Railway Injuries, in Witthaus and Becker's *Medical Jurisprudence*, says:

Hernia in the great majority of instances is the product of muscular effort long continued, along with structural defect, and not the result of immediate and sudden effort. Hernia is always of slow formation, and very few persons are aware of its oncoming, because in its early stages it develops slowly and gradually and almost painlessly.....The railway surgeon, who sees thousands of accidents where every form of intense and sudden muscular effort has been used, and records the history of these accidents, finds rupture as a complication so remarkably infrequent that he is forced to the conclusion that sudden muscular effort is never a cause of rupture. If rupture comes under these conditions, it is only acquired or inherited defects which have led to its manifestation.

R. W. Murray, in a recent book on the Cause and Treatment of Hernia, writes as follows with regard to the relation between accidents and hernia:

It is an interesting point whether, according to the performed sac theory, the sudden or gradual appearance of a hernia is an accident within the meaning of the Compensation Act.

It, of course, depends upon the definition of the word "accident," but even then the difficulty remains as to the exact time at which the hernia developed, for most hernias have a painless origin, and are frequently not noticed until the swelling has reached nearly to the scrotum.

I have frequently been told by the patient that an inguinal hernia, extending to the upper part of the scrotum, was due to a "strain" a week previously. As in these cases the men had continued with their work, and the swelling, not the pain, had directed their attention to the inguinal region, it was obviously a mistaken observation on their part, for sudden stretching of the parietal peritoneum is invariably most painful.

In a large number of laboring men suffering from inguinal hernia who have come under my observation, I have made especial inquiry as to what it was they first noticed. In the majority of cases it was the swelling they first noticed, which appeared without causing any pain. In most cases it was attributed to a "strain."

So that, as a general rule, the formation of a hernia, that is, the stretching of a peritoneal diverticulum, is a gradual process, and a person first realizes that he is ruptured when he sees the swelling. In many cases, however, there has been some pain or a feeling of discomfort in the inguinal region.

The following is from the book by W. McA. Eccles on Hernia:

A person may bring a claim against an accident insurance office on account of his belief that a hernia which has developed is the outcome, more or less directly, of an accident of which he has been the subject. It then becomes the duty of the medical adviser of the office to determine whether or no the protrusion is in reality the result of the injury sustained, or whether it may not have been in existence prior to the accident.

In dealing with cases of this nature, it is important to remember that it is decidedly rare for a hernia to be formed suddenly, and the very fact that the applicant for compensation gives the history of a rapid development should in itself be a cause of suspicion. It cannot be denied that in some infrequent cases, parts of the abdominal wall may be torn by some severe strain, as for instance, in the effort to prevent the fall of a heavy piece of furniture; but in these persons there is a definite "rupture," in all probability, of the parietal peritoneum. This is followed by an escape of the viscera into the extraperitoneal tissue, or if the transversalis fascia and some of the superjacent muscular layers have also given away, the protrusion may pass into the subcutaneous tissues. Occasionally, if bowel has been so protruded, it has become at once strangulated, and an operation has been immediately called for. But this condition of affairs is very uncommon, and need hardly come into the category.

Further, it must be borne in mind that a person who has a patent processus vaginalis may, on account of a great effort, suffer the escape of viscera into the ready-formed sac, where it may become at once strangulated. In both the above conditions, provided that the medical examiner can satisfy himself that the strain was the direct precursor, and therefore, probably the producer, of the hernia, he is justified in allowing the claim, but it is necessary to repeat that such cases are rare.

On the other hand a person may aver that he has developed a protrusion, not suddenly but at a period which is remote from the date of the accident, believing it to have been caused by it. In such a case

the position of the hernia should be of considerable service in arriving at a decision whether or not it has any connection with the accident. *If it is in one of the usual positions for a protrusion, the inguinal, femoral or unbilical regions, it is highly probable that the accident had little or no part in its causation,* while if it is in an unlikely spot, as, for instance, in the lineae semilunares or alba, it is allowable to grant that the injury did participate in its production. Again, if the applicant has lax abdominal walls, or presents a hernia elsewhere than the one asserted to be the outcome of the strain, then his claim can hardly be upheld.

In my opinion, the formation of a hernia is brought about in much the same manner as that of a normal labor. Passing through the different stages:

1. Formation of funnel shape process of peritoneum at internal ring—Bag of waters.
2. Visceral contents—Fetus.
3. Internal abdominal pressure, persistent coughing, straining at stool—Uterine contractions.

These extending over a varying period of time, associated with the above we have to consider:

1. Inherited predisposition; 2. Congenital defects; 3. Mode of living.

I have taken the liberty of incorporating into my paper the ruling of the Nevada Industrial Commission dated September 26, 1913, on the subject of hernia.

Medical science teaches and has taught for the past twenty years, that which is now accepted as a medical and scientific fact, corroborated as such by the foremost surgeons and anatomists of the world, that is, that hernia (or so-called rupture) is a disease ordinarily developing gradually, and which is very rarely the result of an accident.

With the object of treating the subject of hernia justly to both employer and employee, and in accordance with medical and scientific teachings and facts, the commission rules as follows:

Rule 1. Real traumatic hernia is an injury to the abdominal (belly) wall of sufficient severity to puncture or tear asunder said wall, and permit the exposure or protruding of the abdominal viscera or some part thereof. Such an injury will be compensated as a temporary, total disability, and as a partial, permanent disability depending upon the lessening of the injured individual's earning capacity.

Rule 2. All other hernias, whenever occurring or discovered, and whatsoever the cause, except as under Rule 1, are considered to be diseases causing incapacitating conditions or permanent, partial disability. But the permanent partial disability and the causes of such are considered to be as shown by medical facts—to have either existed from birth; to have been years in formation and duration, or both, and are not compensatory except as provided under Rule 3.

Rule 3. All cases, coming under Rule 2, in which it can be conclusively proven; 1, that the immediate cause, which calls attention to the presence of the hernia, was a sudden effort or severe strain or blow received while in the course of employment; 2, that the descent of the hernia occurred immediately following the cause; 3, that the cause was accompanied, or immediately followed, by severe pain in the hernial region; 4, that the above facts were of such severity that the same were noticed by the claimant and communicated immediately to one or more persons are considered to be aggravations of previous ailments, or diseases, and will be compensated as such for time loss, and to a limited extent only, depending upon the nature of the proofs submitted, and the result of local medical examination.

The foregoing is stated to follow rulings in Ohio and Washington. The matter is important, as under the English law there has been the greatest difficulty over this subject.

Oct. 22, 1913. F. T. SHERMAN.

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FOOT AILMENTS.*

With Special Reference to Correction of Relaxed Arches by Means Other Than Foot Props.

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Practice Limited to Surgery of the Feet.

It is to a small group of foot ailments wherein the principal symptoms are pain and slight deformity, I am calling your attention this evening, as these cases are often seen first by the family physician, and because the etiology and pathology of these conditions have not been well understood, the treatment has often been vague and inefficient, not to say indifferent.

Usually the patients give a history of having been treated for rheumatism or being directed to buy a pair of arch supports or props.

As Dr. John L. Porter says, "Pain and rheumatism have, in the past, been so generally treated as synonymous, at least where joints were concerned, and our pathological conception of rheumatism has been so hazy that the term has been a very convenient one to use when we did not know what the matter was; but with our better knowledge of joint disease and of the pathology of true rheumatism, it is time to realize that so far as painful feet are concerned the chances are 95 to 5 against that being the actual trouble."

For some reason unknown to me, both the medical profession and the laity have appeared to consider any affection of the feet, less than a fracture or dislocation, of so minor importance as to be unworthy of serious consideration or careful examination and treatment.

I think if you will pause and reflect for a moment what our feet mean to us, you will agree that they are a very important portion of our anatomy and as deserving of respectful consideration as, for instance, our aristocratic appendices Our very dependence upon our feet in getting about our daily occupations lends added importance to affections of those extremities.

We can suffer a great deal of pain and disability in the hands and other portions of the body without being incapacitated, but when one's feet are out of commission he is "down and out" in every sense of the word.

I cannot too strongly emphasize the importance of carefully examining every case *physically* as well as subjectively.

Simply to listen to a patient's history of chronic pain in his feet, steadily increasing and with more or less disability, and then to tell him he has rheumatism and proceed to fill him up with salicylates, sending him on his way without even examining him or his feet, is surely a travesty on the practice of medicine, but an altogether too common one.*

Some toxemic or infectious process may be responsible for the weakening and giving way of the tissues which support the joints or the relaxing of the muscles designed to maintain and manipulate the arrangement of arches and levers of the foot so constructed as normally to receive and sustain the weight of the body and assist the muscles of the leg in locomotion; but this toxemia is due to some infectious or suppurative process and not necessarily rheumatism.

The point I am endeavoring to make is that pain in the feet may be due to various causes and is important enough to warrant your careful examination and investigation.

The foot is an ingenious arrangement of arches, levers and joints and anything that interferes with their proper functioning renders locomotion awkward, difficult and usually painful. Prominent among the causes of painful feet is the wearing of shoes that subject the feet to constant strain by compelling them to support the body weight in an unnatural manner—shoes so balanced that as the weight is transmitted from heel to toes in the act of walking, it is thrown to the inside of the foot instead of the outside.

In the natural gait the great toe points directly forward or slightly "toed in" (watch your *moccasined* Indian guide), and the weight is transmitted from the os calcis outward and forward in a circular direction to the toes and the finish of the step is given by the five toes successively grasping the ground or shoe. The arches of the foot both longitudinal and transverse are thus quickly relieved of the dead weight of the body and give an elastic springiness to the step, which is their normal function.

When the foot is confined in a shoe which is so balanced as to render this gait impossible, the weight is thrown inward from the heel, strain is put on the longitudinal arch, the toes point outward (Valgus shoes), which soon produces pain and weak feet and it is only a step from weak feet to flat feet and another step to rigidity

*Read before the North Shore Branch, Chicago Medical Society, December 1, 1914.

*Porter: Chicago Medical Recorder, February, 1911.

and then all elasticity is gone, the patient being about as agile as a man on stilts. Also the sharply pointed, high heeled, narrow shanked shoes, at the preesnt so much in vogue in ladies' shoes, cause great strain to be thrown on the transverse (anterior) arch, causing a flattening which is often accompanied by an excruciating spasmodic pain known as Morton's metatarsalgia. This occurs usually in women, as they are as a rule more willing than men to suffer for so-called "style." Women patients afflicted with this ailment have often told me the pain would come on suddenly when frequently there was no weight being borne by the feet; at the theatre for instance. The pain would be so intense and cramplike they would be obliged to remove the shoe at once and massage the foot, which would relieve it.

This is the one condition wherein I believe a metal prop or insole is indicated. An aluminum or German silver insole properly fitted, with a slight elevation behind the heads of the third and fourth metatarsal bones, will almost immediately relieve and eventually cure this painful condition. To make certain of this before putting the patient to the expense of having this plate made, it has been my custom to fashion a graduated pad of piano felt and place it in the position to be occupied by the contemplated metal elevation. This is strapped to the foot with adhesive plaster and worn for a few days. If the patient experiences the relief I anticipate I then order the plate made.

It might be pertinent, as we are on the subject of ailments of the feet due to mechanical cause, to mention hallux valgus, or bunion, as the predisposing cause is the initial distortion of the great toe, nearly always due to ill-fitting shoes; but associated with this distortion—at least in severe cases—is nearly always a gouty or rheumatoid arthritis, which contributes with malposition of the toe and trauma inflicted by the shoe, to produce the bony enlargement and inflammatory articular changes that take place. The deformity is readily and permanently reduced by a radical surgical operation but by no other means and the patient must ever after wear straight lasted shoes which make no pressure on the great toe. So few patients will either take the time or spend the money to have this operation performed that I usually fit the joint with a vulcanized rubber pad, fashioned over a plaster of paris model of the part, that gives immediate and generally permanent relief and hides the deformity (unless unusual), when worn under a straight lasted shoe.

The next group is comprised of those cases due to acute infections, of which gonorrhea is probably the most common. They are usually referred to simply as "gonorrheal feet" rather than "gonorrheal *flat feet*" or gonorrheal arthritis, although most gonorrheal feet become flat if not treated and there are cases in which a true arthritis develops and accounts for part of the pain; but the changes that occur in gonorrheal feet are periosteal and peri-articular, rather than intra-articular. There is a peculiar thickening of all the peri-articular tissues; the foot looks and feels "boggy" and there is a general sensitiveness of the entire foot. The patient experiences practically no pain while at rest but walking or standing is sometimes almost impossible.

The periosteum seems to be infiltrated, especially that of the os calcis, and manipulation of the heel, especially pressure on the tuberosity on the bottom of the os calcis, is extremely painful and the continued irritation of the inflamed periosteum causes exostoses (spurs) to develop later at the insertions of the plantar fasciae on the bottom of the heel. The prolonged infiltration results in a relaxation of the supporting tissues of the arches of the foot and if walking is persisted in, flat foot is nearly certain to result.

Any of the acute infections and debilitating diseases, diphtheria, scarlatina, influenza and typhoid, may result in a relaxation and loss of tonicity of the muscles and tissues supporting the arches. The patient usually gives a history of a gradually increasing amount of pain in his feet for some weeks; can stand for but a short time without being extremely fatigued; has tried various shapes and styles of shoes and has bought many "arch supporters" that he cannot tolerate and has concluded that he has rheumatism. Examination of the feet reveals nothing of note. When he stands the feet are somewhat pronated and flattened, he toes out quite markedly, the astragalus is prominent and deep pressure discovers tender spots, usually around the scaphoid. The evidence is mostly subjective and is principally pain. The joints proper seem to be free of involvment.

Now, it is to the treatment of these cases in this particular stage that I have been pointing this brief dissertation. The object is to give these feet the most comfortable support possible. These feet are entirely too sensitive to tolerate any hard and unyielding prop. My practice is to slightly over correct (supinate) and apply an adhesive plaster and collodion cast to retain the foot in position of inversion, adduction and dorsal flexion.

I use strips of adhesive plaster about one inch wide and twelve inches long; start the first strap a little above the external malleolus, around the bottom and up the inner side of the foot and extending diagonally across the ankle and up the outer side of the leg. The next strap follows the course of the first, overlapping it about one-eighth of an inch and this is followed by about four more, making five or six straps in all. A thin layer of cotton on the plantar surface of the foot under the plaster, will prevent the skin irritation that sometimes results from the strapping. The plaster is now covered with collodion, which renders it practically waterproof and prevents the gum of the plaster sticking to the stocking. This dressing holds the foot in certainly a better position than any metal prop or arch supporter and is *comfortable* to the patient and instead of putting in days of torture "getting used" to a metal prop, there is a perceptible relief at once.

This cast is left on for several days, then removed and the foot manipulated, giving about five minutes passive exercise; inversion, adduction, and dorsal flexion. Then another strapping of the same kind, leaving it on a little longer this time and gradually extending the intervals between reapplying the casts.

When perfect flexibility has been obtained, the strapping may be discontinued but a cure has by no means been accomplished until the patient not only can but does use the foot *at all times* in the physiological way.

Proper shoes with the Thomas heel, which extends forward ¾ of an inch further on the inner than on the outer side, so that secure support as far forward as the astraglo-scaphoid joint maintains adduction more securely. Adhesive plaster strapping as above described may be applied until the patient becomes accustomed to the new position; until the muscular sense has become re-educated.

Exercises: The object of these is to strengthen the muscles and ligaments. There are many athletic sports which will do all the exercising necessary, at least in the mild cases, and for young people they will be found a much more welcome prescription than definite foot exercises to be carried out in the bed chamber. As such may be mentioned tennis, hand ball, volley ball, etc., in fact any game that necessitates springing about on the toes. Roller skating is injurious as the feet are abducted. Dancing is very beneficial for weak foot.

Specific exercises will, however, frequently have to be ordered. Here are four sets which will be very useful in most cases.

1. With the feet forming sides of a square, toes straight ahead, slowly raising one's self upon the toes and slowly returning to the heels.
2. Walking about the room on the outer borders of the feet.
3. Using the toes to pick up articles.
4. Strongly separating the toes.

In the first exercise, care should be taken that the feet are in proper position, parallel and forming the sides of a square. The exercise must be taken very slowly, so that no help is given to the muscles by a swinging motion of the body or by allowing gravity to assist in returning the heels to the floor. It will be found of great help in obtaining a cure, if the patient forms the habit of rising on the toes while the shoes are on. This will not take the place of the exercise done barefooted, but if the patient is instructed never to stand for more than a minute or two without rising on the toes and to rest occasionally on the outer border of the shoes, it will give a valuable rest to the ligaments.

A most valuable exercise, which cannot be done, however, without assistance, is rotation of the forefoot. The patient is seated with one leg resting on the assistant's knee. The assistant holds the heel securely in one hand, pointing the index finger of the other hand with its tip just in front of, and dorsal to, the second toe; the patient moves the forefoot, first in adduction and then through flexion, abduction and extension, in such a way as to carry the forefoot in circumduction around the assistant's finger, which is held steadily in one position. The ex-

ercises for the toes are directed toward increasing the strength of the smaller muscles and thereby strengthening the anterior arch, which will generally be weakened with the longitudinal arch. When sitting, patients with tendency to abduction and eversion, should cross the legs and rest the feet on the outer border, which will rest *all* the foot structures. The patient should also be instructed to practice walking at all times with the toes pointed straight ahead rather than turned out like the arms of a "Y."†

To recapitulate:

1. Foot ailments are *not* trivial affairs, but require and merit your careful examination and treatment.

2. Adhesive plaster strapping and intelligently directed exercises are more efficacious and decidedly more comfortable to the patient than metal props or so-called "Arch Supporters."

I wish to thank Drs. Porter and Nutt for the valuable information I have obtained from their writings and have so freely quoted in this article.

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EXTRA-UTERINE PREGNANCY.*

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An extra-uterine pregnancy is one of the most serious pathological conditions that can befall a woman. Unless a diagnosis is made reasonably early and operative measures be promptly taken, a great majority of these patients will die. But an early diagnosis and prompt treatment should not give a mortality greater than 5 per cent.

If there is any one who should be interested in this subject it is the man doing general practice, the family physician, the man who does the obstetrical work. It is the family physician who is consulted by the pregnant woman if she consults any one, and it is he that is called in practically every emergency. It is on his ability to make a diagnosis and advise or institute prompt treatment that the lives of these patients depend. It is not the surgeon that is primarily called to these cases; if he is consulted at all, it is usually after the family physician has made a diagnosis and has suggested operative measures.

If there be any of you who have practiced obstetrics for many years without ever encountering a case of extra-uterine pregnancy, you have been fortunate indeed. If you have reached the conclusion that this condition is a myth, or as our distinguished president would say a "psychological" condition, rest assured that you will have a rude awakening some day if you continue to do obstetrics. If you are hurriedly called to the bedside of a married lady, who has perhaps missed one period and has been suddenly seized with severe pain low down in one side of the pelvis, find her pulse rapid and thready, skin cold and clammy, nauseated, suffering with dyspnea, acute anemia, find a normal or subnormal temperature, and should her condition go from bad to worse and should she enter the pearly gates within the next twelve, twenty-four or forty-eight hours, it will probably occur to you that you have had at least one case of extra-uterine pregnancy with a ruptured tube and death from internal hemorrhage.

By the term extra-uterine pregnancy we mean the arrest and implantation of the impregnated ovum outside of the uterus. This may occur at any point in the tube from the fimbriated extremity to its termination into the uterine cavity. A few cases are on record of ovarian pregnancy, but they are very rare. If the arrest occurs as the tube passes through the muscular walls of the uterus, it is termed an interstitial pregnancy. The abdominal pregnancies are supposed to have all been primarily tubal. But the rupture of the tube or the expulsion from the fimbriated end has allowed the impregnated ovum to escape and it becomes attached to other tissues and continues to grow. There are a few cases on record where they have survived to full term. Personally, I have never seen such a case.

Practically, all cases are tubal and the rupture, attended with severe pain, acute anemia, dyspnea, and shock, occur from the fifth[2] to the eighth week; seldom later than the twelfth week. Occasionally a rupture will occur prior to the fourth week in a woman who has not even suspected pregnancy. These early ruptures are most difficult to diagnose and are equally dangerous.

As to the cause of ectopic pregnancy, investigators are not agreed. But the consensus of opinion is that it occurs in women who have suf-

†Nutt—Diseases and Deformities of the Foot.

*Read before the Southern Illinois Medical Association, Nov. 6, 1914.

fered from some inflammatory condition of the pelvic tissues which has resulted in a stenosis of the tube which does not allow the ovum to pass into the uterus but does permit the spermatozoa to pass into the tube. Some claim that it follows a salpingitis in which the ciliated epithelium has been destroyed, thereby allowing the spermatozoa to ascend into the tube.

Many of these cases occur in women giving a history of sterility covering many years. In one of our cases the lady had been married ten years and this was her first pregnancy. In another the lady had given birth to a child twelve years before and this was her first pregnancy since. But in many of these cases no history of any pathological condition is present.

Just how frequent ectopic pregnancy occurs is not positively known. In 1888 Lorenze[3] estimated one case in every four or five hundred thousand pregnancies. But in recent years, with our more careful methods of making diagnosis and the impunity with which the abdomen is opened to clear up suspected or doubtful pathological conditions, we know that an extra-uterine occurs at least once in every five hundred pregnancies.[4] This estimate is probably too low; for as one writer puts it, "There are many cases in which the disease is never suspected, for the fetus dies and is, so to speak, entombed."[5] There are other cases in which the patient dies and no autopsy is made to clear up the cause of death.

In 1889 Dr. Henry F. Formand, in his capacity as coroners physician in Philadelphia stated that in six years he had made 22 autopsies of women who had suddenly died of ectopic gestation. "All these cases were tubal, and in all the fatal rupture occurred from the fourth to the eighth week of pregnancy. Death happened in all cases, save one, within twelve hours, and in that case it was delayed five days."

The diagnosis of an extra-uterine pregnancy is of vital importance; and we should always bear this condition in mind when we have occasion to examine a woman of child bearing age, suffering from any pelvic disturbance. Unfortunately, but few pregnant women submit to a physical examination until they are in labor, or until they are suffering from the effects of some pathological condition that should have been discovered and given timely treatment weeks and perhaps months before. I think we should educate the women in the importance of having a physical examination made soon after a supposed pregnancy and again before confinement.

A diagnosis of an extra-uterine pregnancy before rupture is not usually a difficult matter. The principal points are a cessation of the menstrual flow at least one time, then a return of the flow at perhaps the next period and re-occurring at frequent irregular periods that may continue for weeks and months. Often the patient may tell you that they suspect an abortion. Often a complete cast of the interior of the uterus will be thrown off. If this proves to be a decidua, and you also have a pelvic tumor, you can be positive that you have an extra-uterine pregnancy.

In one of our cases the diagnosis was confirmed in this way: If an extra-uterine persists you will have other signs of pregnancy, such as nausea, discolored breasts, later milk in breasts, and rapid enlargement of abdomen. Besides the ordinary signs of pregnancy the woman will often complain of distress and tenderness to one side of the uterus. If examined early a tumor will be found to one side of an empty uterus; but later the tumor may fill the entire pelvis. The uterus is usually enlarged to some extent and the cervix is soft.

Unfortunately we are seldom called to see these patients until a rupture has occurred. Then in addition to the history of a probable pregnancy, you have the sudden onset of excruciating, tearing pain, low down in the pelvis to one side. If there has been much loss of blood you have symptoms of an internal hemorrhage, acute anemia, rapid thready pulse, cold clammy skin, and dyspnia. The temperature will be found normal or sub-normal. If reaction takes place there may be a slight elevation of temperature later. A physical examination at this time will reveal a boggy mass in Douglas' cul-de-sac and a sensitive tumor in one side of the pelvis. The uterus will be found slightly enlarged and the cervic soft. After a rupture, the pelvic abdomen is tender and rigid.

Should the hemorrhage be slight, reaction may follow and the clots be gradually absorbed. Should the fetus be small it may become encysted, or form a tubal mole and cause but little trouble. But if the hemorrhage be extensive and the patient does not die at once, she usually succumbs

in a few days or weeks to a peritonitis. Not a few of these neglected cases become infected and result in an abscess in Douglas' cul-de-sac.

The cases most difficult to diagnose are those in which a rupture occurs early before any symptoms or history of a probable pregnancy. The early rupture does not necessarily lessen the mortality of these cases and many terminate fatally within a few hours. Howard Kelley[6] reports a patient in his practice who, without missing a menstrual period, was taken with violent pains, interpreted as colic from indigestion, and bled to death in two days. An autopsy revealed a mass not larger than a bean.

Douglas[7] reports two cases of unusual interest. A nullipara aged 21 years, perfectly well and disclaiming any probability of pregnancy, was brought to his office in a collapsed condition, having fainted a few moments before while shopping in an adjacent store. Dr. Owen Wilson, a senior medical student, made the diagnosis of intra-peritoneal hemorrhage from an ectopic pregnancy. When Douglas saw her she was in hopeless collapse and died one hour later, two hours from the onset of symptoms. The circumstances were so peculiar that the coroner ordered an autopsy. An ampullary pregnancy of three weeks duration was found, with an immense quantity of blood in the abdomen. In his second case he recognized an intraperitoneal rupture and urged an operation, but it was refused; in six hours from the onset of the symptoms the patient was dead. From the examination of the specimen and from all obtainable facts he inferred that the pregnancy could not have been of more than four weeks duration.

During the month of July of this year, I saw two cases of extra-uterine pregnancy in which rupture occurred prior to the fourth week. Neither patient had missed a period or suspected pregnancy. Both were operated on and both recovered. One of these patients after indulging in sexual intercourse was suddenly seized with severe pain low down on the right side of pelvis. When seen a few hours later she had all the symptoms of an internal hemorrhage, plus tenderness and severe pain in pelvis, and a boggy mass in Douglas' cul-de-sac. When the abdomen was opened it was found to be filled with fluid blood and the pelvis contained much clotted blood. The hemorrhage was coming from the fimbriated end of the right tube from which a small mass had been expelled. She was operated on July 4, and left the hospital July 19, having made an uneventful recovery.

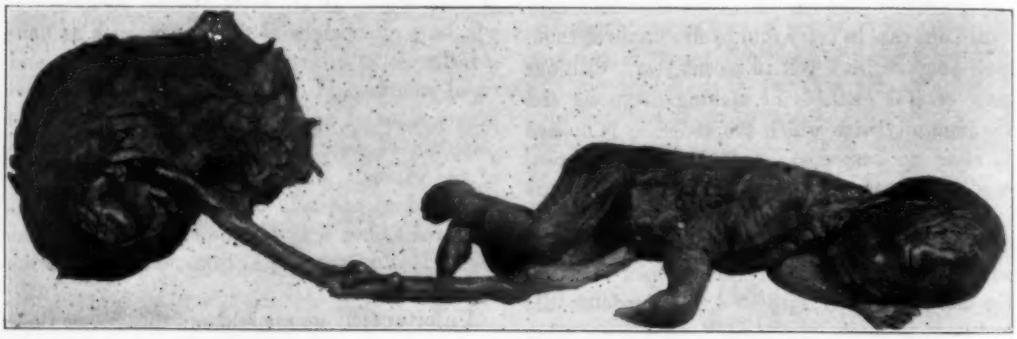

Fig. 1. Fetus and Placenta From Mrs. F.

While most of these cases rupture prior to the eighth week and seldom go longer than the twelfth week, a few are on record in which the tube did not rupture until after the sixteenth week. In this connection I wish to report the following case:

May 6 Mrs. F., aged 27 years, the mother of one child 4 years of age, was referred to me by Dr. Geo. Cremeens. Aside from a normal confinement four years previously, she had been in perfect health until her present trouble begun. She had menstruated regularly up to Jan. 1; she missed in February, but about the first of March had severe cramps and slight flow. Slight flow continued to return at irregular intervals. Once or twice she had been in so much distress that a physician was called, and he administered a sedative. At that time the physician found tenderness and an undue fullness in the lower abdomen. She also gave a history of nausea and vomiting. Present examination showed pulse 110 and

temperature 99.2 The breasts were discolored and enlarged. Vaginal examination revealed a tumor that filled the entire pelvis, having the consistency of a pregnant uterus. The cervix was rather soft and felt that by a little effort the finger could be introduced. Posteriorly and to the right of the cervix was a mass that felt rather hard and firm. Inspection and palpation showed a tumor almost symmetrical filling the lower abdomen. It extended to within two inches of the umbilicus, but from the upper left-hand side was a mass that extended four inches higher than the main body of the tumor. This extended mass or projection was firmly connected to the main body of the tumor and appeared to be a continuation of it. The tumor was not very sensitive and we could slip the fingers under the projecting mass and rock the entire tumor without any evidence of discomfort.

While we were unable to hear any fetal heart sounds, our diagnosis was a pregnancy in a fibroid uterus. She remained in the hospital four days and returned to her home, refusing an operation.

Eight days later she returned, stating that she had suffered some distress the day before and had decided to submit to an operation. Her condition was about as before, except that the projecting mass from the upper left side of the tumor had disappeared, leaving it practically symmetrical. Nowhere could this missing mass be found. The disappearance of this supposed fibroid knocked a part of our previous diagnosis in the head. However, we believed that she had a surgical condition present and decided to make an exploratory operation.

Operation May 21, median line incision. Found omentum and intestines adherent to tumor. Careful dissection exposed the tumor in the upper left portion, of which we found a rent from which an umbilical cord was hanging. Following this cord upward to right side under liver we found a fetus anchored. The fetus was nine inches long and the cord was fourteen inches long. The intestines and omentum were firmly adherent to the fetus, indicating that it had lived for some time after its escape into the abdomen. The tumor from which it escaped proved to be the left tube, which was removed with the placenta intact. (See Fig. 1.)

The patient made an uneventful recovery and was able to leave the hospital for her home June 3, fourteen days following the operation. She has been in perfect health ever since.

The points of unusual interest in this case are:

1. Late period of rupture; about twenty weeks.

2. Absence of loss of blood at time of rupture; no blood or evidence of hemorrhage was found when abdomen was opened.

3. Absence of severe pain and shock at time of rupture; she was able to ride forty miles in a day coach and walked up stairs into the operating room without complaining of any discomfort.

4. Last and most important, her rapid recovery after so serious an operation.

In closing this paper I wish to emphasize the following points:

a. Extra-uterine pregnancy is a frequent occurrence.

b. An early diagnosis is of vital importance; a rupture usually occurs from the fourth to the eighth week.

c. When once a diagnosis is made before or after rupture, no expectant or temporizing measures should be considered, for that spells death in a great majority of cases. But prompt, timely, surgical treatment before a rupture has occurred should give no mortality, and prompt surgical treatment after a rupture will save a great majority of these cases.

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IMPORTANT ANATOMIC AND PHYSIOLOGIC FACTORS IN SUBARACHNOID MEDICATION.*

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The region best adapted for introducing subarachnoid medication is the third or fourth lumbar space between the arches of the vertebrae. This location is uniformly agreed upon by physicians of Europe and America for many reasons:

The arches of the lower lumbar vertebrae are not imbricated as they are above that level; they are separated by a distance of 6 mm. or more, and that distance can be greatly increased by forward flexion of the vertebral column. The ligamenta flava, which connect adjacent arches together, being composed of yellow elastic tissue, are very extensible. However, the strong supraspinous and interspinous ligaments of the lumbar region impose a reasonable limit to the separation of the vertebral arches. Besides ease

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of access to the subarachnoid cavity through the third or fourth lumbar space, the dura mater is said to be more firmly anchored to the vertebrae here than elsewhere and, therefore, is more readily punctured in this location.

The subarachnoid space is large in the lumbar region. It contains the cauda equina, the spinal cord and a considerable amount of fluid, which holds the very delicate arachnoid against the dura mater. In the adult the cord reaches down to the first lumbar space, but it may reach the third lumbar space in the newborn. Hence, the fourth lumbar space is to be preferred in a young child.

A low puncture of the subarachnoid space, also, enables the surgeon more readily to make use of gravity to obtain a free discharge of cerebrospinal fluid.

To locate the fourth lumbar space, draw a line between the highest points of the iliac crests when the vertebral column is flexed sharply forward. This line will cross the spine of the fourth lumbar vertebra. As a control, count the spines upward, the fifth lumbar spine being prominent in this position of forward flexion. The spinous processes of the lumbar vertebrae are thick quadrilateral plates, with nearly horizontal superior and inferior borders, and a bulbous and slightly pendent dorsal border. They are joined together by strong supraspinous and interspinous ligaments. To avoid both these ligaments and the spinous processes which they connect, the needle should be introduced 6-10 mm. from the median line and directed slightly upward and median-ward. The distance to the subarachnoid space varies greatly, from 2-7 cm. It must be estimated by the operator and the needle controlled by the resistance of the tissues.

The object of subarachnoid medication is to get closer to the tissues to be affected by the treatment.

It is a well known fact, first pointed out by Bevan Lewis, that the body of every nerve cell is surrounded by a lymph space. This is also true of the bodies, of neuroglia cells. Because of this, the blood stream can get no nearer to the body of a neurone than this pericellular lymph space and a capillary wall will permit. The pericellular spaces are continuous, on the one hand, with the freely communicating canals of Holmgren inside of the cell-body, by means of which nutriment is carried to the neurone and waste products are borne away from it; and, on the other hand, the pericellular spaces open into the subarachnoid space by way of perivascular and perineural channels. To affect the neurones, therefore, a substance must gain entrance into the so-called lymph channels.

There is some evidence showing that many substances do not pass from the blood into the cerebrospinal fluid with facility. This is generally true, according to F. W. Mott,[1] of all drugs and bacterial toxins. Swift and Ellis[2] claim that potassium iodide given by mouth or intravenously does not appear in the cerebrospinal fluid. A few centigrams of potassium ferrocyanide injected into the cerebrospinal fluid of a rabbit produced toxic symptoms, in the experiments of Lewandowsky; while 4-6 grams in the jugular vein caused no symptoms. Behring injected tetanus toxin into the veins of hens without effect, but induced typical tetanus and death by introducing it into the cerebrospinal fluid.

The late Prof. Edwin E. Goldmann of Berlin discovered that the cells of the chorioid plexuses stand guard over the cerebrospinal fluid and keep noxious substances out of it. He injected trypan- and isamin-blue into the blood, and afterward found the chorioid plexuses loaded with color; but found none in the cerebrospinal fluid or in the brain and cord. He lays great stress upon the large granular cells of the chorioid plexuses as protectors of the nerve tissues. If then the chorioid plexuses tend to keep all noxious substances out of the cerebrospinal fluid, it would seem desirable, in order to get quick and powerful effect on the nerve tissues and their contents, to throw the medicinal substance directly into the subarachnoid space. This procedure was successfully carried out in the treatment of nervous syphilis by Swift and Ellis of the Rockefeller Institute in 1912. Wechselmann and Marinesco obtained such direful results from salvarsan injected into the subarachnoid cavity that Swift and Ellis, after confirming that unfavorable experience by animal experimentation, devised a method for using the patient's own salvarsanized serum. Once in the cerebrospinal fluid, the salvarsanized serum or other substance might be expected to spread by diffusion to all parts of the brain and cord and there produce the

alterative and germicidal effects of which it is capable.

But there are some factors to be considered before drawing a general conclusion.

Prof. Edwin E. Goldmann[4] found, when he injected trypan- and isamin-blue into the spinal subarachnoid space, that the spinal cord, the brain-stem, and the optic nerves were stained; but the cerebellum, the cerebral hemispheres and the cranial nerve roots, other than the optic, contained no color. When the injection was made into the cranial subarachnoid space the cerebellum and cerebral hemispheres were affected. From which, we must infer that a medicament introduced by lumbar puncture would not readily affect conditions in the cerebral hemispheres or cerebellum. But it is claimed that brain syphilis is usually located between the cerebral peduncles and the optic chiasma. Such cases, of course, are amenable to this method. The amount of benefit to be expected can better be predicted after considering the source and flow of the cerebrospinal fluid.

At present it is the consensus of opinion that the cerebrospinal fluid is a true secretion formed by the chorioid plexuses, which F. W. Mott, four years ago, named the "chorioid glands." This "secretory hypothesis" was first advanced by Faivre, in the *Annals of the Sciences* in 1854. It was supported by Luschka, whose name has been given to a pair of foramina in the roof of the fourth ventricle, two years after the article by Faivre. Many writers, since, concur with this view. Pittit and Girard, in a monograph published in 1902, find proof of the hypothesis in many vertebrates besides man.

Evidence for the secretory hypothesis of Faivre.

1. That cerebrospinal fluid is not a mere exudate from the blood vessels and, therefore, is nothing other than lymph, is shown by its character. It is more like tears and sweat than lymph. It lacks the corpuscle content of lymph; it has only half the alkalinity of lymph, it has no fibrinogen at all and only a mere trace of any protein, and it has from 3-11 per cent. more CO^2 than is contained in lymph. Cerebrospinal fluid contains small amounts of sodium chloride, carbonates, phosphates, urea, 53-61 per cent. of CO^2, a trace of globulin, glucose, and, when drawn by lumbar puncture, a few lymphocytes. Its specific gravity is 1006-1008. Hence we must conclude that it is not an exudate of ordinary lymph.

2. The glandular structure of the chorioid plexuses of lateral, third and fourth ventricles merits consideration. This characteristic of the chorioids was noticed as far back as 1664 by Willis. Many investigators have strongly emphasized the fact, especially since the work of Faivre and Luschka, published near the middle of the last century. F. W. Mott made a careful study of the "chorioid glands" and published his findings in the London *Lancet* July 2 and 9, 1910. He found the chorioid plexuses made up of tufts of blood vessels surrounded by loose connective tissue on which stands a single row of large granular epithelial cells, cubical, spheroidal or polyhedral in form. Many nerve fibers are found around the arteries and in the connective tissue, forming plexuses whose terminal fibrils end among the epithelial cells. The gland is formed by an invagination of ependyma followed by a tuft of vessels from the pia mater. Mott compares the structure to the lachrymal gland. There is surely a very plain resemblance to the glomerulus and surrounding epithelium of a renal corpuscle. Mott classifies the chorioids as intermediate glands, having an external secretion with an internal destination.

Again, the extract prepared from chorioid plexuses greatly stimulates the flow of cerebrospinal fluid, when injected into a vein. A number of other substances are also secretory stimulants, but not to the same extent. They are such drugs as chloroform, ether, chloral hydrate, urethane, diacetin, alcohol, CO^2, cholesterin, etc. The chorioid extract probably contains a specific hormone, a product of brain metabolism, which, because the chorioid cells will not permit it to pass, accumulates in the plexuses and stimulates their activity. Roy and Sherrington discovered in 1890 that an extract of the brain substance stimulates the flow of cerebrospinal fluid. The normal fluid is not a stimulant; but cerebrospinal fluid obtained from cases of general paralysis and brain softening stimulates like the brain extract. (*Jour. Physiol.*, 1890.)

The cerebrospinal fluid fills the ventricles first and overflows into the subarachnoid space through the median and lateral apertures of the

fourth ventricle. This imposes a limit to its possible sources.

The fact that the cerebrospinal fluid first enters the brain ventricles and thence flows out into the subarachnoid space is indicated by the following findings: When the ventricular outlets are occluded, viz., the median aperture of Magendie and the lateral apertures of Luschka, or Key and Retzius, in the roof of the fourth ventricle, the result is internal hydrocephalus, which could not be so if the fluid were formed outside the brain. If then the cerebrospinal fluid is not an exudate but a secretion and is found primarily within the brain, especially within the ventricles bathing the gland-like chorioid plexuses, it seems very probable that those chorioid glands secrete it and pour it into the ventricles. The largest chorioid plexus is that of the lateral ventricle, the glomus chorioideum being quite massive. According to the secretory hypothesis, therefore, these two chorioid plexuses should secrete the larger portion of cerebrospinal fluid. If most of the fluid is formed in the lateral ventricles, it must flow largely by way of the interventricular foramina of Monro, the third ventricle, the cerebral aqueduct and the fourth ventricle into the subarachnoid space; and any obstruction in the third ventricle will produce increase of intracranial pressure and, if continued, internal hydrocephalus of the cerebral hemispheres. Such cases are on record. Mott gives an interesting case of intermittent increase of pressure within the cranium presenting many attacks of sudden drowsiness, headache, convulsion and recovery; and, after some time, gradual loss of memory, failure of comprehension, etc. Post mortem revealed a pendent polyp hanging from the roof of the third ventricle, which easily swung back like a valve and closed the cerebral aqueduct.

From the evidence at hand the most reasonable conclusion is that the cerebrospinal fluid is secreted by the chorioid glands. Filling the ventricles, it overflows into the subarachnoid spaces. By way of a canalicular system composed of the pericellular spaces in the brain and cord and the perivascular channels which connect them with the subarachnoid space, the cerebrospinal fluid comes into direct contact with the bodies of the neurones. Robin discovered the perivascular channels in 1858, and the later studies of his revealed two concentric channels about the brain vessels bounded by double sleeve-like sheaths, which he called adventitial and periadventitial sheaths. These sheaths surround the veins and arteries of the brain and cord; but, according to Mott, do not cover the capillaries. According to the findings of Schwalbe, Key and Retzius, Quincke, Jacob, Lewandowsky, Bruno, Mott and others, the perivascular channels freely communicate with the pericellular spaces within the cerebrospinal axis and the subarachnoid cavity around it.

The cerebrospinal fluid is under a certain normal tension and exerts a pressure of 100-150 mm. of water (sodium carbonate solution) when the body is in the horizontal position, and 410 mm. when the body is in the sitting posture. In pathologic conditions this pressure may rise to 700 mm. or more (Krönig). Quincke's pressure measurements are about the same. Reduction of this pressure by the withdrawal of a portion of the cerebrospinal fluid is a source of danger in arteriosclerosis and syringomyelia.

The normal amount of cerebrospinal fluid present at one time is stated by Mott to be 100-130 c.c. But as many as 1000 c.c. have been collected in 24 hours, and even 2 litres, from a man with punctured meninges (Billroth), so it is evident that the fluid is ever forming and is discharging constantly from the subarachnoid spaces. The discharge is two or three times faster from a cranial than a spinal puncture (Dixon and Halliburton).

The direction of the current in the subarachnoid space is of prime importance, but is not yet fully determined. Certain investigators claim the subarachnoid fluid escapes along the perineural channels of the cranial and spinal nerves and enters various lymphatic vessels and nodes from which it passes on to the venous circulation. This seems reasonable and is supported by the experiments of Flatau on the olfactory nerves of rabbits. He injected the perineural spaces of this nerve and traced the substance to the cervical lymphatics. But Orr and Rows,[8] in the current number of *Brain*, prove by many experiments and cases of their own and by the extensive work of others (Marie and Morax, Homén and Laitinen, Perrone, Guillain, Marie and Guillain, Sicard and Bauer, Spitzer, Zalla, etc.), that the lymph stream of cranial and spinal nerves is an ascending one; it empties chiefly into the

lymph spaces of the brain and spinal cord but, to some extent, into the meningeal spaces also.

Homén and Laitinen injected streptococci into the sciatic nerve and traced them upward to the meninges. Perrone employed pneumococci in the same nerve; they very soon reached the cord and involved those segments connected with the sciatic, on the same side. Guillain injected ferric chloride into the sciatic. Subsequently, he introduced potassium ferrocyanide into the general circulation, and found Prussian blue in the posterior roots of the nerve and the posterior columns of the spinal cord. Twenty-four hours after injecting bacteria into the sciatic nerve, Homén found bacteria lining the perineurium proximal to the point of injection, the sheaths of the spinal ganglia, the anterior and posterior roots of the sciatic nerve, the meninges of the lumbar enlargement of the cord, and the peripheral substance of the cord itself, especially along the posterior median septum. Spitzer injected abrus precatorius into the pulp of a dog's tooth. After a few days, he found under the microscope an ascending neuritis of the trigeminal nerve reaching the semilunar ganglion and involving it. Many other experiments and cases may be quoted, but these are sufficient to show that cerebrospinal fluid does not escape through the perineural channels.

Leonard Hill and Cushing reached the conclusion that this fluid escapes through the veins into the sinuses. They injected a saline solution with methylin blue into the subarachnoid space and soon detected it in the jugular vein, but found none of it in the lymphatics. They injected other substances, as mercury, a non-absorbable gas, etc., with the same result. Reiner and Schnitzer injected a solution of ferric chloride and afterward a solution of potassium ferrocyanide, in the same way, and found Prussian blue in the jugular vein but not in the lymphatics. According to these investigators the subarachnoid fluid escapes through the perivascular spaces, around the veins of the pia mater, into the sinuses of the dura mater, especially into the superior sagittal sinus.

Orr and Rows,[6] in their article on "The Lymphogenous Infection of the Central Nervous System" show that the spinal subarachnoid fluid escapes in a similar manner. They introduced colored fluids into the subarachnoid space about the spinal cord and were able to trace them, first, into the adventitial sheaths of veins and capillaries and, thence, into the veins themselves. Contrary to the observation of Mott, Orr and Rows found adventitial sheaths about the capillaries, as well as about the veins and arteries. Tracing the course of colored fluids and the extension of infection and toxic inflammation, they conclude that the cerebrospinal fluid flows out through the capillaries and veins of the respective regions. Lewandowsky agrees with this conclusion; he adds the arachnoid granulations of Pacchioni as supplementary outlets for the cranial fluid. At present ample facilities for draining the subarachnoid space are demonstrated beyond question. Hence, this inquiry arises:

When a substance is injected into the subarachnoid space, by lumbar or cranial puncture, does it flow out through the perivascular channels accompanying the immediate tributaries of the lumbar, intercostal and vertebral veins and the intracranial veins emptying into the dural sinuses, or does it enter into the cerebrospinal axis, along similar perivascular channels, there to penetrate the walls of capillaries and veins and flow into the blood stream? If the subarachnoid fluid flows directly out into the veins, then the subarachnoid space is a very disadvantageous entrance for a remedy designed to influence the central nervous system; because that remedy must traverse the whole circuit of the blood stream, and perhaps run the gantlet of the chorioid glands, before it can enter the central nervous system. On the other hand, if the fluid flows into the brain and cord in order to enter the capillaries and veins, then the subarachnoid space affords the most favorable approach possible to conditions existing in the central nervous system.

There is some evidence of the existence of currents of great importance whose flow is into the nerve tissues. The work of F. W. Mott, the investigations of Dixon and Halliburton, and the monograph of the late Prof. Goldmann all indicate that the cerebrospinal fluid bears the nutritive substances to the brain and cord and receives the waste products of metabolism from them. Mott even suggests that the subarachnoid fluid gives water and CO^2 to the blood and receives oxygen and sugar from it, the latter upon reaching the neurones being converted into neu-

ral energy by a glycolytic ferment. It is an indisputable fact, manifest to everyone acquainted with relations of nerve cells, that nutriment can pass from the blood to the nerve cells and waste products from those cells to the blood through no other medium than the "ambient lymph," which surrounds the nerve cells. According to our present evidence, the "ambient lymph" is cerebrospinal fluid. But this does not necessitate the passage through the chorioid plexuses of all nutritive substances destined to the brain and cord. Such an assumption seems preposterous and impossible; the blood supply of the brain is so rich the chorioid arteries are relatively so diminutive; and the metabolic processes in the neurones are so constant. However, this does not militate strongly against subarachnoid medication.

The work of Orr and Rows has demonstrated some very important facts: 1. An ascending current in the lymph stream of nerves. 2. A continuity of the perineural and epineural spaces, containing the lymph stream, with the meningeal spaces and with the intramedullary spaces of the spinal cord (and brain). 3. Continuity of the intramedullary spaces with the adventitial spaces of capillaries and veins. And 4. The emptying of these adventitial spaces into the veins themselves. Since the capillaries connecting the arteries and veins of the brain and cord are embedded within the cerebrospinal axis, it follows as a natural consequence, that a certain amount of cerebrospinal fluid must reach the blood stream through the intramedullary channels of the brain and cord. Nature thus furnishes a natural medium to carry the subarachnoid remedy to the very heart of the neurones.

The intramedullary lymph channels are probably arranged into systems which communicate with each other to a limited extent but have very free intrasystemic communication. Marie and Guillain deduce from their investigations the probable existence of a common lymph system for the posterior roots of spinal nerves, the posterior columns of the cord and the pia-arachnoid covering them. In this system the lymph flows freely among the nerve fibers. D'Abundo and Guillain support this deduction; they trace the lymph upward and forward in the posterior columns. Tabes dorsalis, it is claimed, is a lesion of this system resulting from lymphogenous infection. Acute and chronic myelitic conditions, general paralysis of the insane, acute poliomyelitis and the acute ascending paralysis of Landry are, also, said to be lymphogenous infections. Whether there are other definite lymph systems in the spinal cord and brain that set the bounds for systemic lesions is not yet determined; but there is revealed already an interesting prospect for the subarachnoid devotee and there is some promise of great results from subarachnoid medication.

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TECHNIC FOR THE PREPARATION OF SALVARSANIZED OR NEOSALVARSANIZED SERUM AND ITS INTRASPINAL ADMINISTRATION.

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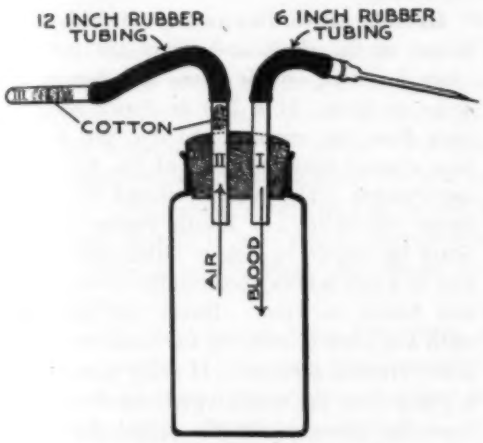
Since Doctors Cotton, Swift and Ellis, McCaskey, Robinson and others have established the value of the salvarsanized or neosalvarsanized serum in the treatment of brain and cord lues, it behooves all to acquaint themselves with this method of treatment. In the first place, I consider it one of the most essential things to have a healthy and pure serum, free from lipoid or fatty substances, chyle or food products. In appearance, it should be perfectly transparent and of a straw-greenish bile color. If a serum is turbid, thick, creamy in appearance, this is due to lipoid or chyle, and it is not suitable for administration.

In order to get as pure a serum as possible, it is best to first have your patient under observation for two or three days before administering the remedy; this is to get a line on his general health; besides, fleshy or fat people generally have more or less lipoid or fatty matter and food products circulating in their blood at all times. Lipoid or fatty matter and chyle will cause a

serum to deteriorate rapidly, even though taken under sterile conditions and kept in the ice box. Fat people should be put on a special light diet and given a laxative for two or three days before the administration of the medicine.

The time to administer the medicine and take the blood should be before the meal. This is to avoid lipoid or chyle in the serum. After administering the salvarsan or neosalvarsan, wait thirty minutes to one hour and take about 60 c.c. of blood from the vein at the elbow. Swift and Ellis' conclusions from their experiments were, that the proper time to take the blood was one hour after administration of the medicine. McCaskey recommends waiting from thirty to forty-five minutes. I have been unable to observe any difference in the serum, whether the blood was taken in thirty minutes or one hour.



BLOOD TAKER

To take the blood I prefer to use the following method: I use a 3 oz. salt mouth bottle into which is fitted a rubber cork with two perforations from 4-6 m.m. in diameter. Through these perforations I pass two pieces of glass tubing, about 3 inches long letting them extend ½-inch within the bottle. To No. 1 piece of glass tubing I attach a short piece of rubber tubing 4 to 6 inches long; into the other end of which I insert a No. 19 size needle. In No. 2 piece of glass tubing I place a small amount of sterile cotton. A piece of rubber tubing about 1 foot is passed over the end of No. 2 glass tubing. Into the other end of this rubber tubing I insert a No. 3 piece of glass tubing. No. 3 is also fitted with sterile cotton, and is called the mouth piece. The sterile cotton in the glass tubing is to prevent any contamination from saliva passing into the container and also to prevent the sucking of blood into the mouth.

All parts of the apparatus must be properly cleansed and thoroughly sterilized. This can be done by boiling the rubber tubing and needle for twenty or thirty minutes. The glass parts after cleansing can be baked at a high temperature, 150 to 200 degrees C. for thirty minutes. I usually take the blood from the vein at the elbow. First, tie a rubber constrictor or bandage above the elbow to distend the vein; if the vein is not sufficiently distended, a few backward and forward motions of the arm will distend the vein more. Do not tie the constrictor so tightly as to stop the flow of blood through the arteries; if you do, you will not be able to get the proper amount of blood. Cleanse the skin over the vein at the elbow with alcohol and just before inserting the needle, put it through an alcohol flame. Insert the needle in the course or direction of the vein with the beveled point outward or upward. As the needle enters the vein make suction on the mouth piece of blood taker. After taking the amount of blood required, which is usually about 60 c.c., before withdrawing the needle, untie the constrictor or bandage, make pressure where the needle enters the skin and withdraw the needle, continuing to make pressure over the vein for a short time after the needle has been withdrawn to avoid a hematoma.

Immediately after taking the blood close the rubber tubing of container by applying artery forceps. Wrap the container of blood with sterile gauze and place in the ice box for a few minutes until a clot has thoroughly formed. After clotting, remove the rubber cork and pass a sterile wire between container and the blood in order to loosen the clot from the container, so that the serum will separate more readily. After loosening the clot do not put the same rubber cork back in the container, but use a sterile glass stopper. Wrap the container in several thicknesses of sterile gauze and again place in the ice box for serum to separate. Just before

time to administer the salvarsanized or neosalvarsanized serum pipette off (I prefer to use a 20 c.c. Luer syringe with a long 18 or 19 size needle attached), the serum from the clot and centrifuge out any corpuscles.

Prepare two centrifuge tubes by proper cleansing and sterilizing and tying several thicknesses of sterile gauze over the top of each centrifuge tube. This is to prevent any contamination while centrifuging. These tubes can now be resterilized on account of possible contamination in tying the gauze over centrifuge tubes. If one uses a Luer syringe the needle can be passed through this gauze and equal amounts of the serum put into each centrifuge tube. Close the perforation in gauze caused by the sterile needle, by drawing the fibres of cotton together. See that the sterile gauze is cut short that it will not interfere with the centrifuge tube fitting into its holder.

After centrifuging, pipette off the serum with Luer syringe, first removing several outer layers of gauze, passing the needle through the gauze; or one can remove the gauze from the centrifuge tube and pour the serum directly into the test tube, provided there is only a small amount of corpuscles thrown down. Place this serum in a strong glass test tube, ¾-inch in diameter by 8 inches long, having a plain end that will not break so easily when heated. Seal the test tube by heating in flame. After the test tube has been sealed, immerse or completely cover in a water bath and inactivate at 56 degrees C. for thirty minutes.

The serum should be administered soon after inactivating, because it is frequently the case that serum after inactivation immediately begins to deteriorate and this is why I advise the administration as soon as properly cooled to 38 degrees C or 100 degrees F. While the serum is being inactivated one should sterilize the spinal needle and syringe as well as prepare the patient by cleansing the back with alcohol and painting with iodine.

To make the spinal puncture, I use a No. 18 or 19 size needle. For grown people the barrel of the needle should be about 3 or 3½ inches long, with a short, sharp, beveled point. This needle can be fitted with a plunger if desired; however, for drawing spinal fluid, where one does not have to be particular if a small amount of blood comes away with the spinal fluid, I prefer to use an open needle with a Wassermann laboratory special stop cock attached to the outer end. This stop cock is so arranged when the needle enters the spinal canal the spinal fluid will immediately pass out, and the flow can be controlled by the stop cock. At the same time to the direct end of the stop cock, a short rubber connection can be made with the Luer syringe. The lever of the stop cock is now turned in the direction of the needle and the salvarsanized serum injected. This rubber connection rather insures safety as any little motion imparted to the needle will not be so likely to wound the intra-spinal membranes which might cause a slight hemorrhage. Again, it occasionally happens that the point of the Luer syringe is broken off if direct union is made between the needle and the syringe.

Have the patient lie on either side with the legs flexed on the chest, and direct the patient to place his head on his knees and bow out his spine or back. If a line is drawn across the back from the crests of the ilia, this line will pass over or near the spine of the fourth lumbar vertebra. The puncture should be made between the third and fourth lumbar vertebræ. Start the needle ½-inch to either side of spine and on a line midway between the spines of third and fourth vertebræ. Direct the needle upward and inward, entering the canal through the intra-vertebral foramen. If using a needle with a plunger, as the needle enters the canal, withdraw the plunger. If the spinal fluid comes away too freely return the plunger, to allow the fluid to drop slowly away. Too fast a flow of spinal fluid may provoke a headache or other unfavorable symptoms.

It occasionally happens that one gets what is called a dry puncture with the patient lying on side. In such a case, one should remove the needle, have the patient sit up in bed with the legs flexed upon the chest and spine bowed out as directed when lying on side. Even in this position it occasionally happens that the spinal fluid comes away slowly. Directing the patient to sit erect will allow the fluid to flow more freely. In any case where the spinal fluid comes away slowly or under a low pressure, it is best

not to take too great an amount of spinal fluid, not more than 8 to 12 c.c. However, it is best to have the patient lie on the side, with the head and shoulders on a level or a little lower than the hips when administering the salvarsanized serum.

After one has taken the proper amount of spinal fluid, have ready a 20 c.c. Luer syringe properly sterilized, cleanse the test tube containing the salvarsanized or neosalvarsanized serum with alcohol, and with a small sterile file make a rather deep and long nick low down on the drawn end, tap the drawn end to break off and pour the salvarsanized serum into the Luer syringe, first placing several layers of sterile gauze over the point where the needle fits on to the syringe, and holding in place with the finger to keep the serum from running out. Now start the piston and invert the syringe, and pushing forward the piston till a drop of serum stands at the needle part, insert the needle part of syringe into the needle which is in the spinal canal and make very slow or light pressure on the piston while injecting the serum. The amount of inactivated serum administered is from 12 to 20 cc. The patient should be kept in bed with his head low for at least two or three days until completely recovered from the effects of the injection.

Usually there is but little disturbance after the first day or two, however, it occasionally happens that severe disturbances will follow for a few days after an intra-spinal injection.

In the preparation of the serum one should observe the strictest precautions to prevent any contamination. The room in which it is prepared should be as aseptically furnished as the surgeon's operating room and the individual preparing the serum should be dressed as the surgeon, wearing a gown and have the head and mouth covered with sterile gauze. In addition, the materials should be handled with a 10x15-inch glass screen between the person preparing it and the serum. An ordinary window glass will answer this purpose fairly well.

In conclusion I wish to emphasize. First, the patient should be in as healthy a condition as possible. Second: The patient should be especially prepared by dieting and given a laxative for two or three days. Third: Administer and take the blood before the meals, "preferably before breakfast." Fourth: The time for administering the salvarsanized serum is according to Swift and Ellis 12 to 24 hours after the withdrawal of the blood. Fifth: Observe the strictest laboratory precautions in the preparation of the serum to prevent any contamination.

Sixth: Remember this is a surgical operation and the physician who administers the remedy should prepare himself as the surgeon does for a major operation. Seventh: Keep a close observation of the patient for at least 6 to 10 days after the spinal injection. Eighth: Injections can be repeated in 1 or 2 weeks till the desired number are given, this being usually 3 to 6 or 8.

2159 W. Madison Street.

THE INTRA-SPINAL ADMINISTRATION OF NEO-SALVARSAN, USING THE PATIENT'S OWN SPINAL FLUID AS A VEHICLE, TECHNIQUE AND DEMONSTRATION.*

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I want to express to you my appreciation for the invitation extended by your president to present this case before you.

Case 1. I am presenting this case especially, as it is one of cerebrospinal lues which has been under my care since the early part of May, 1914, and he has received no other treatment except the intraspinal injections of neosalvarsan. The first examination of the spinal fluid in May of this year showed a cell count of 200 cells with a positive Nonne and positive Noguchi, as well as a positive Wassermann test. We then injected three milligrams of neosalvarsan into the spinal canal. A second examination of the spinal fluid was made in the early part of June, which showed a cell count of 66, with the positive Nonne and negative Noguchi. A second injection was made at that time and on July 6, about one month later, the cell count of the spinal fluid was 20. A third injection consisting of 3 milligrams of neosalvarsan was made at that time. Since then no examination of the spinal fluid has been made. At the time of entrance into the hospital the patient showed a decided paresis of the entire right side of the body

*Read before the West Side Branch of the Chicago Medical Society, Oct. 15, 1914.

and he complained of great weakness in the right arm and leg. Both the subjective and objective symptoms have materially improved and today he does not complain of any weakness of the right side of the body, although the face on the right side still shows slight evidence of paresis of the muscles of that side.

Our method of administering neosalvarsan has been as follows and we have made about 40 different injections, and as far as my personal experience goes, I have had absolutely no untoward results in any case; I dissolve .15 gram of neosalvarsan in 2½ cubic centimeters of distilled water which has been again freshly boiled and cooled. This preparation is very soluble in this amount of water and makes a hypertonic solution or a 6 per cent. solution of neosalvarsan. I take 1 minim of this solution and after allowing 8 to 10 c. c. of spinal fluid to flow into the barrel of a Record syringe, the 1 minim is dropped into the spinal fluid so as to allow it to be thoroughly mixed with the spinal fluid in the syringe and after obtaining 16 to 20 c.c. of spinal fluid in this manner, it is then reinjected very slowly into the spinal canal.

In the experience of those who have obtained untoward results and in some cases disastrous results of which I have personal knowledge, I believe they can be accounted for on the basis of the technique employed. Either a trauma has been produced to the meninges or the amount of spinal fluid has been too small, thus making a too concentrated solution which, coming in contact with the cauda equina, has produced organic changes, or perhaps the injection has been made too high and the lower portion of the cord may have been involved.

It seems to me that this method of medication has some advantage over the Swift-Ellis method of treatment in that it is much simpler, the dose apparently is more accurate and the dangers of infection are much less. I might say in conclusion that the mixture which I have described above, contains 4 milligrams to each minim of the solution. Consequently, in administering a dose of 3 milligrams, 20 c. c. of spinal fluid can be withdrawn and then reduced to 15 c. c. before reinjecting. I believe the smaller dose is preferable to larger doses.

THE INTRACRANIAL TREATMENT OF PARETIC DEMENTIA.

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In December, 1913, Marinesco and Minea reported the injection of salvarsanized serum into the subdural cavity in two cases of paretic dementia. Each case received 20 milligrams dissolved in 2 c. cm. of the patient's inactivated serum injected into one side of the skull only.

In the *Revue Neurologique* of March 15, 1914, they reported the injection of seventeen more cases. In these cases they gave ten milligrams dissolved in 4 c. cm. of inactivated serum into each side of the cranial cavity. There was some psychic improvement in four of the nineteen. Four had epileptiform convulsions following the injection; one had a monoplegia of the left arm lasting for a few hours. None of the four had any return of the accidents.

Encouraged by these reports I have used the intracranial injection in two cases in the Cook County Hospital.

Case 1. Tony M., aged 34 years, entered the hospital June 12, 1914. For the past seven months he had had trouble in walking, becoming more and more uncertain, until at the time of entrance he could scarcely walk at all. He had cramping pains in the legs and there was slight incontinence of urine at times. Denied venereal infection.

Examination revealed pupils which reacted to convergence, but were fixed to light; a markedly ataxic gait; a marked Romberg sign, slight incoordination of hand movements; loss of pateller and Achilles reflexes; loss of ulnar, testicular and Achilles pain sense, as well as a generalized diminution of response to the pin prick. He was too stupid to permit of any satisfactory mental examination. Urine was negative. There were 24 cells to the cubic millimeter in the spinal fluid, phase 1 positive. Five days after entrance he had three typical epileptic convulsions about ten minutes apart, each followed by a period of confusion in which he had to be restrained. Following these convulsions the plantar reflexes were temporarily decreased and the great toe showed an extensor response.

On July 8 I made a Neisser-Polock puncture eight centimeters above the orbital arch, 2.5 centimeters to right and to left of the median line. This was immediately preceded by a spinal puncture with the withdrawal of about six c. cm. of spinal fluid. One hundred mgm. of neosalvarsan were weighed out, dissolved in five c. cm. of spinal fluid and injected subdurally, one-half into either side of the cranial cav-

*Read before the West Side Branch of the Chicago Medical Society, Oct. 15, 1914.

ity. Fourteen hours later he became restless and resistive. Twenty-four hours later temperature was 104 rectal, pulse 136, and respirations 36. Three days after the injection, temperature, respiration and pulse had returned to normal. Twenty-three days after the injection the patient had two convulsions similar to those already recorded. At present he is in very much the same condition as upon entrance.

Case 2. Claude P. was admitted to the hospital March 25, 1914. He was thirty-three years of age. His illness started three months previously with tremor of the hands, arms and lips. His speech became halting. "I said what I wanted to, but had trouble getting it out." About the time of the onset he began to lose control of his legs, the gait becoming progressively more difficult. Running had been impossible for two months. Vision had failed noticeably in the past two months. There was imperative micturition at the time of entrance. He had had a chancre and secondaries about ten years ago. Drank considerably up to five years ago, but little since. Married four years, three children alive and well, one miscarriage following a fall. Upon examination he showed a very marked tremor around the mouth; the pupils reacted normally to light and accommodation; the deep reflexes were all brisk, with a bilateral ankle clonus. Plantar flexion was normal.

Dr. E. V. L. Brown reported a beginning primary optic atrophy on the right side, advanced optic atrophy on the left, with multiple areas of old, disseminated choroiditis.

Lumbar puncture revealed phase 1 positive, one hundred cells to the cubic millimeter. Lumbar puncture April 28 showed eighty cells to the cubic millimeter; May 19 ten cells to the cubic millimeter. On this last date Dr. Hall injected three mgm. of neosalvarsan into the lumbar dural sac. June 5 there were twenty-six cells to the cubic millimeter; the spinal injection was repeated. These treatments were very well borne.

From June 15 to July 10 the patient's condition rapidly became worse. He was very restless, ran away whenever the opportunity presented; several times he cut his straps, broke out the window screen and ran away in his hospital shirt. His gait and station also rapidly became worse, so that early in July he frequently fell upon attempting to walk across the ward. July 10 one hundred mgm. of neosalvarsan dissolved in five c. cm. of spinal fluid were injected subdurally, one-half into each side of the cranial cavity. Four hours after the injection he vomited; twelve hours later he had a temperature of 102 degrees per rectum. Five hours after the injection he had some difficulty in speaking; forty-eight hours after paresis of the right hand appeared.

July 13, three days after injection, he presented a paralysis of the right lower face and arm, less of the leg. The right wrist jerk and triceps jerk were slightly more brisk than the left. Articulation was very poor and he was somewhat apathetic. There was no Babinski sign. The following day Dr. Hall observed and noted the following phenomena: The patient's head turned to the extreme right; there was right conjugate deviation of the eyes, twitching of both eyelids and the right side of the face, still greater twitching of the right hand and arm, none of the leg, which became very rigid. The pupils were fixed and the patient did not respond when spoken to. One-half hour later head and eyes had resumed normal position. The patient recognized the nurses and responded when spoken to. The right hand still twitched and there was slight twitching of the right eyebrow. There was right plantar extensor response. Thirty-six hours later a practically identical convulsion took place. July 15 Nonne reaction was strongly positive and the spinal fluid showed a slight yellowish tinge, suggestive of hematogenous pigment.

Three weeks after the onset of the hemiplegia it had entirely disappeared. When he was able to get about the ward after the slight dragging of the right leg had disappeared, his gait was noticeable better than before the intracranial treatment. His mentality had so much improved that he was commonly used as a messenger boy by the nurses on the ward, whereas previously he had run away on every occasion, cutting his restraint straps when necessary.

October 9 the lumbar puncture was repeated; twelve c. cm. of spinal fluid was drawn, five c. cm. to be used for injection and seven c. cm. for examination. Seventy-five cgms. of neosalvarsan were dissolved in fifteeen c. cm. sterile distilled water. One c. cm. of this solution, containing fifty milligrams of neosalvarsan, was mixed with five c. cm. of spinal fluid. Not having an electrical drill for the Neisser-Polock puncture and being forced to depend on a hand drill, I had the patient given gas. Under the anesthetic, however, he continued to struggle and became very cyanotic, so I ceased giving him the anesthetic and let him come out before making the puncture. This was done on the left side without any discomfort, owing to the fact that I happened to strike one of the previously made holes. On the right side, not being so fortunate, the slow drilling caused him some discomfort, which he said was no worse than that caused by the lumbar puncture. Into these puncture holes twenty-five milligrams of neosalvarsan in two and a half c. cm. of spinal fluid was injected on either side.

For twenty-four hours following this last injection the patient seemed fairly well, though towards the end of this period he was beginning to get a little stupid and apathetic. During the following week he had on the average about one slight convulsion a day; in none of them was the loss of consciousness of more than a few seconds' duration, and in none were the motor manifestations of more than a moderate degree. During this period of a week he was more or less apathetic, answered in monosyllables and then only when urged. Mental ability was evidently less than before this last injection. This addition to the history, written October 24, finds him improving rather markedly during the past four days, in which there

have been no convulsions. The clinical examination of reflexes, movement and sensation shows practically no change.

Note, February 24, 1915.

Patient had slight daily convulsions for four days, November 16 to 20. December 1st another injection was made of 20 mgm. dissolved in 3 c. c. of spinal fluid into either cranial half. Two weeks later he began to have attacks in which he would give a hoarse cry, raise the right arm rigidly above his head, twitch about the mouth, and then appear dazed for a few moments. If standing at onset would not fall. For two weeks he had these spells, four to six in an hour, then be free a few hours and again the fits; then he gradually improved. January 20th a ventricular puncture was made; 16 mgm. dissolved in 18 c.c. ventricular fluid were injected. Temperature gradually rose to 102° thirty-six ohurs later. Three days later right arm and face paralyzed. The next day irrational and visual hallucinations; paralysis disappeared in three weeks. Since then has improved so that now he reads understandingly, plays cards, and takes part in the life of the ward. He is, however, irritable and unstable emotionally.

Previous methods of treatment of paretic dementia have certainly given no great results. Because of the poor blood supply, relatively speaking, of the cortex it seems quite possible that this region should continue to harbor spirochete when other more vascular areas have proven hostile to them because either of antibodies or spirocheticidal drugs. There is no doubt that substances travelling in the blood stream do penetrate the non-vascular areas of the cortex, but probably not in as great a quantity as they would other more vascular areas. If it is advisable to increase the amount of any given substance in the cranial cavity the direct injection through a small puncture would seem to me practically and theoretically the proper method to pursue. There are several reasons why the direct intracranial injection is preferable to the intraspinous, if experience proves what my results seem to indicate so far; namely, that the dangers are not great. In the first place, we are injecting the spirocheticide into the immediate neighborhood of the disease-producing organism. Thereby we give it the greatest chance of acting directly. In the second place, it seems possible to use very much higher dosage here than by the lumbar route. Marinesco has used ninety-five milligrams divided between the two sides without harmful result; I have used one hundred without serious permanent harm. This is against three to five milligrams intraspinously.

With even this small dose in the lumbar region some very unfortunate accidents have occurred. Whereas in the lumbar dural sac the free-lying roots are completely bathed in the arsenious liquid, in the cranial cavity only the surface is immediately exposed and the underlying tissue is being bathed by its normal fluid. So far as the procedure itself is concerned, on both occasions when I used a drill having 1750 revolutions per minute the puncture was made with practically no expression of pain by the patient. Making the puncture as recommended, eight cm. above the orbital arch and two and one-half from the middle line, allows the injection to be made over relatively dumb areas of the cortex.

30 North Michigan Boulevard.

EXPERIENCE WITH ABDERHALDEN SERO-DIAGNOSIS IN PREGNANCY, CARCINOMA AND NERVOUS DISEASES.*

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Our experiences with the Abderhalden test, comprising some 300 examinations, in which we were able to follow the case clinically, to determine the final diagnosis, is not sufficient to warrant drawing any definite conclusions as to its reliability. Nevertheless, we believe that we are in possession of a number of facts as a result of our experience that warrant us, at least insofar as the clinician is concerned, in calling to his attention some facts that may tend to establish a better understanding regarding this procedure.

The results of our experimental work upon animals regarding these so-called protective ferments, have borne out the statements of Abderhalden as to their specific nature. However, owing to our lack of knowledge, we are at present unable to control our experiments as regards the

*Read before the North Shore Branch, Chicago Medical Society, November 8, 1914.

amount of proteid injected and, as Abderhalden says, are brutal in our work, insofar as we probably inject amounts thousands of times greater than are presented in the natural course of events. It is true that in the beginning we encountered difficulties, due principally to improper preparation of fundaments, and, to a slight extent, defective dialyzers, but these have been overcome. In addition, we have made many tests in which we were unable to follow the case clinically. These naturally are of no value.

Although many observers, especially Pierce and Williams, Kammerer, Flatow and Plant doubt, and some even deny, the specific action of these ferments, many equally prominent authorities affirm Abderhalden's claims.

The variations in results are probably due to variations in the fundaments and technic, leaving out of consideration improper technic; and also, I believe, due in a great measure to the natural limitations of the test being as yet not understood or even known.

In all our tests we adhered rigidly to the original Abderhalden technic. We believe that until improvements in the technic that promise great advances have the support of a number of competent observers, the original method of Abderhalden should be strictly adhered to.

Above all, we must realize in the beginning that the test is not a test for pregnancy, or carcinoma, etc., but a test to determine the presence or absence in the serum of ferments, capable of digesting placental, carcinoma, or other definite albumins. To be of clinical value in diagnosis, we must go even further, if possible, and determine that these ferments are specific and not non-specific proteolytic ferments.

Practically all observers agree that negative reactions are of great value, but positive tests may be the result of errors in substrat, technic, or due to the presence of non-specific proteolytic ferments. It would seem that a positive reaction, if due to these non-specific proteolytic ferments, could be in a measure determined by testing against a large number of fundaments and this apparently is proving true. Therefore, I believe that in the future we will test our serum against a variety of diverse fundaments, as well as the special one in question. Irrespective of what specific ferment we are searching for in a particular serum, we will test that serum against thyroid, liver, fibrous tissue, brain, placenta, various carcinomas, etc. If we obtain a reaction with only one definite variety of substrat, we are more certain of its specific nature. While a negative reaction with placental albumin, is of value, in the case of carcinoma, this does not hold true unless we use as substrats a variety of histologically different fundaments. We have obtained reactions in cases of columnar carcinoma with columnar carcinoma fundaments only. This holds equally true for squamous-cell carcinoma, although in three cases sera reacted positively with either columnar or squamous-cell fundaments. This might be considered as analogous to the group reactions mentioned by Abderhalden.

The reaction to parenchyma is probably specific, while that to stroma is not. This must be taken into consideration, for a positive reaction against a fundament prepared from a thyroid carcinoma may mean a specific carcinoma, stroma, or thyroid parenchyma ferment, and these must, if possible, be differentiated by using as fundaments a histologically identical carcinoma from some other organ than the thyroid; also, a thyroid parenchyma fundament. If there is a reaction with thyroid fundament and carcinoma fundament from another organ, the indications are that a carcinoma is present. It may be in the thyroid, or it may be in some other organ, with a concomitant pathologic condition in the thyroid gland. We must not lose sight of the fact that our cases are not always plain carcinoma cases. The average pathological case rarely is, owing to the interdependence of one organ upon another. Further, metastasis in other organs, as a result of pressure necrosis, may result in the serum reacting to fundaments from these various organs. Much of the difficulty with carcinoma fundaments, in which the stroma reacts, may be obviated by preparing these fundaments from metastases, which are usually rich in parenchyma and poor in stroma.

We must always consider a positive reaction questionable until we have eliminated the probability of a reaction being due to the presence of other cells than the essential ones in our fundaments.

A positive test with placental fundaments, tests

with other fundaments being negative, means the presence of a specific ferment for placental albumin, from which we infer that the patient harbors placental elements. It does not necessarily mean pregnancy, as it may be produced by the simple retention of syncytial cells in the uterus, hydatiform moles and chorio-epithelioma. We must not consider a positive test with placental fundaments as meaning pregnancy, except it is confirmed by a thorough clinical history and examination.

In many of the cases in which positive tests for placental fundaments are reported in males and others with pathologic conditions, we note the preponderance of conditions in which there is a high leucocyte count. This positive reaction may be due to the presence of non-specific ferments from the leucocytes. We know that the leucocytes secrete proteolytic ferments, as they are principally concerned in the liquefaction of the pneumonia exudate, and in sections, an area of liquefaction may be seen surrounding the leucocytes. If these ferments are absorbed into the blood stream, they must continue to exert their action, and as they are non-specific, would react with a number of fundaments.

It is to be remembered also that in late and grave cases of malignancy there are no specific ferments in the serum, indicating a cessation of reaction to the disease on the part of the patient's cells.

If the question of carcinoma only can be decided by means of sero-diagnosis, it will be of untold value in such cases in which a piece of tissue cannot be obtained without a major operation; or where, early in the disease, a differential diagnosis, especially as regards carcinoma of the internal organs, is well nigh impossible at present without an exploratory operation.

Owing to the ever present desire on the part of the profession for a specific and ready method for diagnosis, we are inclined to rush at any new procedure blindly, especially when it is proposed, as this was, by a man such as Abderhalden, whose recognized high standing was the result of an enormous amount of work on proteid metabolism. All clinical laboratory signs are only of value when taken as a part of the whole symptom-complex. We must weigh carefully all the signs and symptoms and then attempt to decide upon a diagnosis.

The apparent simplicity of the test, and the original claims concerning its specific nature, have led us to demand too much of it, and failing in one or two cases, to discard it as worthless. We forget that this test, like all others, has its restrictions. We do not condemn the Wassermann because it gives a positive reaction in yaws, etc., nor the Widal because it is negative in the early stage; but we do not rely upon them entirely, and we must take all laboratory findings only as additional symptoms that serve to confirm or deny the other clinical signs.

5444 LAKEWOOD AVE.

INJURIES OF THE HEAD.

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Centuries before the circulation was discovered trephining was done in different countries for injuries of the head, as has been well demonstrated by skulls unearthed that bore the antemortem marks of the trephine; and yet the conservative surgeon of today would sometimes give all he possessed to know when, and when not, to trephine an injury of the head.

While we have made definite progress in the treatment of this form of injury in the last decade, yet we are still far from the goal when it comes to making surgery of the head an exact science.

How strongly are we reminded of our limited knowledge in this branch of surgery, when called to a severe emergency head injury.

What would it be worth to the surgeon if he only possessed definite knowledge, and could say, this is a case of compression, or this is a case of concussion, or it is a case of concussion complicated with compression or contusion, or that it is a case requiring operation, or one in which an operation is clearly contra-indicated?

While I shall not attempt or claim to give anything new, if only with my limited experience in this class of injuries I can lay down for your guidance a few landmarks, this paper will not have been written in vain.

Probably the most frequent class of head injuries which the surgeon is called to treat are cases of concussion.

These are the cases not dependent on fracture, contusion, or tearing of the blood vessels,

and many times autopsy fails to show the slightest trace, or visible alteration, in the brain of the deceased.

I remember a few years ago to have been called to treat a man, who, while hunting, accidentally shot himself with a shot gun. When the explosion came the muzzle of the gun was within a few inches of his head, and the charge of shot, wads, etc., plowed a furrow through all the temporal muscles and outer table of the skull, in the temporal region, but not a shot entering the cavity of the skull, and yet the man was killed almost instantly, as was testified to by one of his hunting companions. He never breathed after being shot. I afterward held a post-mortem, removing the valvarium, and examined the brain, and there was not a mark of contusion.

The force of the concussion had produced an instantaneous paralysis of the cerebral cortex, vagus and vasomotor centers.

In head injuries the respiratory center is always paralyzed before the circulatory, the heart often continuing to beat for some time after the respirations have ceased. If someone had been present who understood this fact, and had performed artificial respiration for a time, this man might have recovered.

What is the picture presented to the surgeon in uncomplicated cases of concussion? The patient is, above all, unconscious; he sees, feels, and hears nothing. His expression is that of one in a deep sleep.

The extremities are cold, the skin pale and has a pinched expression, there is usually repeated vomiting, especially immediately following the injury. The pupils contract when suddency exposed to a bright light, and as a rule, they will swallow when liquids are poured into the mouth. One of the cardinal symptoms is deep respiratory efforts alternating with superficial and irregular breathing, that sometimes stops, only to begin again after a pause. The pulse becomes less frequent, often sinking to forty or less to the minute. If the patient becomes worse and the end approaches, the pulse that has been slow becomes more rapid and the rapidity increases until the pulse becomes weaker and ceases to beat altogether. If on the contrary the patient becomes better, the pulse first recovers and returns to its normal frequency.

For sake of convenience, I have divided these cases into three classes:

In the first or milder class of cases, the patient is benumbed and unconscious, but the heart does not become slow; thus we know that only the cerebral cortex and not the vasomotor centers are affected, which allows the heart to go on working in a normal way.

In the second class of cases we know a greater degree of violence has been done, and that not only the cerebral cortex has been paralyzed, but the vagus centers have been stimulated to increased activity.

In the third or severe form of concussion, not only are the higher psychical functions profoundly depressed, but also the automatic apparatus hidden in the medulla oblongata is attacked. The patient lies in the deepest coma, and in contrast to the other forms of concussion the pulse is rapid and irregular.

When we come to analyze symptoms of concussion, we are able to extract certain underlying principles; we find the common factors in these cases are first, that the symptoms are produced with extraordinary suddenness, and with fullest intensity at the very outset; second, that thereafter they diminish in intensity progressively, and are transitory; that is, they disappear in a few hours or days at the least. Any condition, therefore, which remains stationary for a long time, or which grows worse, is not pure concussion, and after a reasonable time, if there is no improvement, we can no longer rest our diagnosis on uncomplicated concussion, but must assume the presence of a more severe lesion, such as hemorrhage or contusion.

The thing that actually happens in cases of concussion, is a disturbance of consciousness in varying degrees, together with alterations of the normal cardiac, respiratory and blood pressure functions.

The former we refer to as lesions of the gray matter of the cerebral cortex, the latter to a derangement of the three vital centers in the medulla, viz., the respiratory, the vagus or cardio-inhibitory, and the vasomotor. If we keep clearly in our minds the mental picture of concussion it enables us to differentiate between cases of concussion and compression.

A history of the case will often enable us to make a diagnosis.

Concussion is of necessity produced by the sudden impact on the skull of a body in rapid motion, or of the rapid motion of the skull against a body. There must be a blow. For instance, when a slow moving wagon wheel runs over a man's head and injures it, we know it is not concussion, or when the bumpers of a slow moving train catch and injure his head, that the same thing obtains.

The surgeon should, if possible, determine whether or not the injury produced an immediate effect on the central nervous organization (concussion) or a disturbance of the circulation (compression) or those that are the result of destruction of brain tissue (contusion), or a combination of all of them.

Concussion.—In the treatment of concussion, nothing should be done that will in any way depress the heart's action. The surgeon should attempt to restore the bodily warmth by putting the patient in bed and covering with warm blankets, hot water bottles to the extremeties, hot mustard plasters over the heart, hot cloths over the abdomen. The most powerful stimulant to the heart is the faradic electric current applied over the heart and over the soles of the feet and palms of the hands, as it instantly increases the blood pressure.

The head should be shaved so that it can be thoroughly inspected.

The head of the bed should be lowered so as to favor the circulation to the brain. The most important indication to be met is stimulation of the heart. After removing the mustard place sponges wrung out of hot water over the heart. Hypodermic injections of camphor oil or ether are beneficial. If symptoms of congestion set in after recovery from the concussion, the head should be covered with an ice cap.

During the stage of congestion the patient is very quickly quieted with an injection of morphin, which is indicated on account of the hyperemia. When we are called to treat a case of compression of the brain, we should not forget that the brain is enclosed in a complete bony casing, and is entirely incapable of being compressed into a smaller compass without injury to its structure.

Here again we are greatly aided in our diagnosis by a history of the case. When we see a patient who has only recently recovered from an attack of concussion, and in a short time begins to complain of ringing in the ears, flashes of light, headache, vomiting, restlessness, drowsiness, delirium, congestive flushing of the face (observe the contrast in concussion where we always have extreme pallor), contracted pupils, increase of blood-pressure, and a beginning slow pulse, we know that we have to deal with a case of hemorrhage somewhere in the brain, because of the "free interval," and the train of symptoms that rapidly followed.

Ninety per cent of the hemorrhages after injuries of the head are from the middle meningeal artery or some of its branches. If the hemorrhage be small, and the pressure only a moderate one, we will have only the headache, delirium, vomiting, flushing of the face, slow respirations and pulse, with rapid rise of blood pressure. If, however, we have, in addition, stertorous respirations of the Cheyne Stokes type, the face livid and the slow pulse becomes rapid, we know the end is near and that we have only a limited time in which to relieve our patient.

I know of no test for compression so sure as rise in blood pressure, and the surgeon should, if possible, carry with him to cases of head injury a sphygmomanometer, in order that he may take the blood pressure, because in cases of compression, the pressure will rise suddenly from normal to two and even three hundred, which is one of the most important diagnostic symptoms.

Let us discuss briefly what takes place in the brain in cases of compression. The cerebral cortex is the seat of consciousness, requires the greatest amount of nutrition, and is more easily disturbed than any other portion of the brain. Consciousness is lost more readily than any other function and, vice versa, returns only after the circulation has been fully restored.

As soon as the compression takes place it produces an anemia of the brain by squeezing out the blood and paralyzing the cortex, this in turn stimulates the vasomotor apparatus which causes the blood vessels of the rest of the body to contract, and as there is no vasomotor apparatus in the cerebrum proper, it forces the blood from the rest of the body into the brain and nourishes it, and is nature's method of restoring the circulation.

The vasomotor centre, however, can only retain its stimualtion for a limited time, and then the blood pressure falls again, often below the

normal, only to go up again when the vasomotor apparatus resumes its stimulation. And thus we see the life and death struggle going on between the compressed anemic brain and the vasomotor centres; and when the compression pressure exceeds that of the vasomotor centre death occurs from a paralysis of the vagus, or centres of respiration and circulation.

If the compression is caused by a fragment of bone pressing upon some portion of the brain, the pressure symptoms come on without any free interval as in hemorrhage, and unless it be removed by operative measures it produces permanent and constant encroachment on the cavity of the skull.

All, even the most severe symptoms of general compression, may disappear as soon as the factors causing compression are removed, or they may not. As long as the circulation continues regular and of good volume, there is no cause for alarm, but a condition of deep coma, however, with complete muscular paralysis and a total loss of sensitiveness to external impressions, with dilatation of the pupils and irregular deep respirations, will terminate fatally unless some remedy be applied immediately. Patients may recover completely from conditions of stupor with slow pulse, even after it has continued for weeks.

The treatment of cerebral pressure consists always in the removal of the cause. Whenever possible, and when the necessary surgical interference does not involve more danger than the intracranial pressure itself, the endeavor should be made to remove the factor producing it, whether it be a depressed fragment of bone or an extravasation of blood.

Before opening the skull we should, if possible, make a differential diagnosis, because cases of concussion *do not* call for surgical interference.

In cases of compression, if we have decided an operation is necessary, before opening the skull we should, if possible, locate the seat of the lesion, as it will oftentimes save extensive trephining, and subjecting an already badly shocked patient to additional shock and danger.

In order to locate the lesion, the surgeon should by all means have a fair knowledge of cerebral localization, and in that way he is able to say in the majority of instances whether or not the lesion is located in the frontal, parietal, temporal or occipital lobes.

Since ninety per cent. of the hemorrhages of the brain are from the middle meningeal artery the surgeon should have a knowledge of the location of this vessel and its branches in the brain, as it will greatly aid him in locating the hemorrhage.

Cases of mild paralysis coming on from 24 to 48 hours after injury are, as a rule, due to collections of serum or edema and should not be trephined. Cases of hemorrhage producing moderate pressure symptoms do not require trephining, as the clot will usually be absorbed.

The cases in which pressure symptoms come on shortly after injury and the paralysis persists, should be trephined to prevent the ill effects on the nerve fibres of continued pressure, and to restore consciousness, and by that means prevent inhalation pneumonia, from which so many patients die.

In all cases of pressure symptoms on the medulla it is imperative that trephining be done, as the bulbar centres always give out in a few days under continued pressure.

The entire scalp should be shaved and cleansed with soap and water and alcohol, ether or benzine, except that no washing should be done in the wound, or in close proximity to it. In cleansing the scalp, always wash from the wound, instead of towards it. Always protect the wound with sterile gauze when cleansing the scalp. Pick out all foreign particles from the wound with sterile forceps, and sponge the wound with a 20 per cent. solution of iodine, taking care not to allow it to run off the sponge into the brain or meninges. The entire scalp should be covered over with a 50 per cent. solution of iodine.

If in doubt relative to the location of the compression it is better to expose a large area of the brain, and I know of no method so good as Cushing's osteoplastic flap, as in that way you can turn out a large sequestrum of skull with the scalp attached, which, after the clot is removed, can be laid back into position without danger of the bone dying.

To do the Cushing's osteoplastic flap operation quickly, and deftly, a small trephine, a Marion's guide and a Gigli's chain saw are necessary. Always make the arch of your flap toward the top and the base below. The large flap enables you to more effectually expose and remove the clot and secure the bleeding vessels.

I believe, gentlemen, that in every case of

head injury we are called to treat, we should weigh well the symptoms before deciding to open the skull. We should always take the conservative course, as I believe it to be the height of rashness and lack of wisdom on the part of the surgeon to trephine the skull of every unconscious patient with a head injury.

DISCUSSION.

(Abstract)

Dr. W. F. Grinstead, Cairo: The subject of craniocerebral localization is right at the bottom of procedures in the management of all these head injuries. If we know where the sinuses are in the skull, if we know where the principal arteries are, then we can see or learn from the circumstances where the force of the blow has been spent.

We know that the seat of most of the motor functions is located along the fissure of Rolando. We know that one of the principal arteries of the brain is the middle cerebral, which the great Charcot named the "artery of cerebral hemorrhage." That is the artery which knocks so many of us old fellows over without any warning at all, and we don't know how it happened. It lies in the fissure of Sylvius. However, this artery or the branches of it is not the artery nor the branches that usually concerns us in hemorrhages following injuries. As brought out by the essayist, the middle meningeal is the artery that most concerns us, but the branches of the other artery may be entered, as it lies beneath the membranes of the brain and it also lies deep down in the sulcus of Sylvius.

Now, if we draw a line from glabella, we will say, right over the top of the head to inion, we have got the line marked out that divides the two hemispheres and locates the superior longitudinal sinus. Next, we want to locate the upper end of the fissure of Rolando. You see, along the fissure of Rolando is located the function of the arm, the function of the leg, the function of the body and face and head. An inch back of the center corresponds to the point of the upper end of the fissure of Rolando.

To get at the lower end of that fissure approximately we will run the line seventy-five per cent. of the distance from glabella to inion; put the tapeline on that and bring it over to the external angular process of the frontal bone which is easily located with your thumb. Now, then, I will pass a line directly up from the center of the space beneath the condyle of the mandible perpendicular to this line. I am now approximately at the inferior Rolandic point.

That is a simple, easy rule which we can carry in mind and when we have a head injury we will use the razor, will mark the lines out, and we can put our fingers on the injury, if shown by any of the functions of the body.

The next most important point is the direction of the middle meningeal artery, which the essayist says is most commonly injured when we get hemorrhage and get a clot and pressure. Now, if we run a line from the center of the external auditory meatus, right up to this twenty-five per cent. distance, that passes across the Sylvian point where the middle cerebral artery comes out from underneath and shows in the fissure of Sylvius. Just in front of that a small distance is the course of the middle meningeal artery. It runs along the front part of the squamous portion of the temporal bone and the front part of the parietal bone. That is a simple method of locating these things.

By this method of locating the Sylvian point, we also locate Broca's center of speech. You remember that Broca, in 1861, explained to the profession and the world that the center of speech existed in the inferior frontal convolution of the frontal lobe of the brain. Some years ago, I had a patient brought to me ten days after the injury. There was no sign of an injury anywhere at all, except a little blackening of his upper eyelid. The man walked into the office; his brother came with him, talked his case over, and explained to me that the patient had been at work on a farm when a limb fell, striking him on the side of the head. There was no depression, no tumefaction, not anything there at all except a little discoloration of the eyelid. The man had never spoken since the injury; he ate well, slept well, walked about everywhere, but had not spoken a word. I shaved that fellow's head and marked out carefully Broca's center, and I trephined him. I made the crescentic flap, as the essayist has advised, bored a small groove, put in the DeVillbis trephine, ran it around so I could get a piece of bone out, took a Horsely drill separator, and raked out a thick, heavy clot that had been poured out evidently from the middle meningeal artery, and put the piece of bone back. When I first began to practice surgery I thought all these pieces of bone had to be thrown away. I thought that if they were detached they would necrose. That is a great mistake. Some of you older gentlemen may remember how Senn used to take these pieces, lay them in a tray of hot normal salt solution, leave them until he had finished his operation, and then put them in. Be sure that if there is bony contact on each side, these pieces will live and will fill up the gap, and you need not be afraid, either, if you do not find a clot outside the membranes of the brain, to open the dura. I have had patients where the injury itself had opened the dura and brain substance to the amount of a teaspoon or two had run out; I have had those cases do well. Avoid infection in such cases and your patient is all right.

Dr. J. L. Wiggins, East St. Louis: I wish I could feel the supreme confidence of the essayist in his differential diagnosis between compression and simple shock, but unfortunately I am unable to do so. The rule is that where you have a degree of shock as treated of by the essayist, you have either an extradural or a subdural hemorrhage or edema of the brain.

Another point that I think the essayist overlooked in the treatment of these cases was in his diagnosis, and the diagnosis means a great deal in the initial treatment. As Dr. Grinstead said, you can open the dura, but there is a great deal of satisfaction in knowing whether this hemorrhage is extradural or subdural. Of course, if unconsciousness continues, you can glean a great deal from that, because we know that unconsciousness comes as a result of compression, and if the hemorrhage is extradural compression does not take place as soon as it does if it is subdural, but a spinal puncture where there is any doubt will settle that point.

The unconsciousness and the conditions of which we complain are the same whether it is the result of hemorrhage or a serum, it is compression. The object is to remove that compression. The mere fact that it is subdural makes the greater necessity for relief before destruction ensues. There is absolutely no danger in an operation upon the meninges of the brain, provided you use strict asepsis.

Dr. A. H. Meisenbach, St. Louis: I think that Dr. Mitchell, in his paper, which has been very comprehensive, has covered the subject of cerebral surgery as it is understood today very well. When the head is struck by a body we have what is known as a commotio cerebri take place, which may be strong enough to break up the histological elements of the nerve centers. If it is deep enough we have symptoms as described by Dr. Mitchell, but his explanation cannot be improved upon. We know also that fractures occur by contre-coup, so that it may not be possible to detect at the site of impact of the blow that there is an injury, the effect taking place at the opposite side. We may also have rupture of blood vessels into the brain itself, and here I must differ with my friend from Cairo in regard to the artery of cerebral hemorrhage of Charcot, which is not the cerebral artery, which is the lenticulo-striate artery. This is the artery which is in danger in the syphilitic or the man that is arterioscleriotic, that breaks when he is undergoing some strain, where there is increased blood pressure.

In July, a man was brought to me from southern Illinois. He had been hit on the head from before with a wagon spoke and he was struck again high over the left parietal eminence, by a man from behind. The man was unconscious for six hours, had hemorrhage from the left ear. At the hospital he was not suffering from any of the acute symptoms of either concussion or compression. He was sent up with the idea that possibly an operation might have to be done. His pulse, however, indicated a certain amount of compression; it was between fifty and sixty and not too great in volume. There was no disturbance in the eye—the fundus was examined by an oculist and no disturbance was found. I watched him for forty-eight hours and concluded that this was not a case for operative interference, that Nature would come to the rescue. I placed him upon observation, gave iodide of potash and calomel, and in three weeks' time the man went home to his farm in southern Illinois.

As far as cerebral localization is concerned, it is important, but since the introduction of the Gigli saw, the instruments of rapid penetration of the skull, saws, etc., and the making of the osteoplastic flap, this question of localization is not as fine a point in operative interference as it formerly was, when very small openings were made in the skull for diagnostic and operative purposes. I think we can lay down as a general rule that compression ought to be removed, and the chances are in nine cases out of ten that it must be removed by surgical means, by decompression.

Dr. H. F. Stanton, East St. Louis: I agree very decidedly with the way the doctor ended his paper, about this conservative business of going into the head. About fourteen years ago I was thrown entirely over a runaway team and lit on the top of my head on the curbstone. I was unconscious ten days. I had hemorrhage from the ears, nose and mouth, but the conservative method brought me through all right.

The paper of Dr. Mitchell was an excellent paper and almost exhausted the subject, and what it did not exhaust Dr. Grinstead filled up. Now, you know that cerebral localization is something you have all been reading and discussing and trying to find out about, and I presume that the majority of the men, and especially the younger men, understand cerebral localization. If some of you still have doubts I would suggest that you write Dr. E. T. Patrick of Chicago and get one of his pamphlets about cerebral localization. He is one of the best men on that subject that I have ever listened to.

Some years ago, in the village in which I live, we had a cyclone. About 150 people were killed and over 200 injured, and among those 200 I remember there were 27 cases of head injury. The majority of them had to be trephined or they had to have decompressions. Some of them had scarcely anything to go on outside, but after trephining or making an osteoplastic flap, we would find the inner table shattered badly, and, gentlemen, I believe that the one thing to do when you can find the point where trauma was applied and you have the localization symptoms is to make an exploratory incision.

The only case of these head injuries that we lost was a young lady, where we got into an argument whether or not we should trephine and did not trephine. Every case that we trephined got well and our technique was at that time not as good as that described by Dr. Mitchell.

Dr. H. C. Mitchell, Carbondale, closing: I think I have little to say in closing this discussion. There were one or two criticisms because I did not cover the entire field, I believe, of head injuries. I would just like to say if any man here can cover the entire field of head injuries in a fifteen minutes' paper, I should be glad to hear him.

Dr. Wiggins mentioned the point of edema. No

less an authority than Dr. Von Bergmann says that edemas should not be trephined, as the collection of serum is very promptly absorbed and will never produce any very deleterious results. I know that I have seen cases of injuries of the base, in which patients lay unconscious for three weeks or longer, make perfect recovery. I thing our tendency is a little too much to interference in these cases. I believe the conservative plan in these cases is the better one.

HYPERFLEXION OF THE SPINE WITH MULTIPLE SPINOUS PROCESS FRACTURES WITHOUT ACCOMPANYING LESIONS.*

ORLANDO F. SCOTT, M. D.,
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As a brief introduction to this subject a small amount of time should be allotted to the discussion of the relative frequency of spinal fractures in general, and in particular. Sawyer states, "that spinal fractures occur in less than 1 per cent. of cases." Stimpson, "that; of this less than 1 per cent spinous process fractures occur in but 4 per cent of spinal fractures; ½ of these occurring in the dorsal (thoracic) region; ⅛ in the lumbar region."

These relative percentages resolve themselves into statistics as follows. That there occurs but one, or less than one, spinal fracture in every 100 general fractures. Of this percentage, only four in 1,000 spinal fractures are spinous process fractures. Or, four in 10,000 general fractures are spinous process fractures. Of these spinous process fractures two in 1,000 occur in the dorsal region and 0.5 per cent in 1,000 occur in the lumbar region. Or, relative to general fractures, two in 10,000, and 0.5 in 10,000 respectively. Regarding the etiology of such fractures I find, that the various authorities and contributors differ considerably. I, herewith, submit an etiology based on a careful and precise search of the literature, coupled with personal experiences and deductions, which seem to more fully elucidate the factors involved in spinous process fractures.

ETIOLOGY.

1. *Direct Causes.*—(*a*) Trauma applied directly at any angle to the spine, over a spinous process or processes, *without hyperflexion*. This type of fracture may occur regardless of whether or not one extremity of the body is fixed and the other movable. (*b*) Voluntary muscular action of violent hyperflexion (bending) or twisting (rotation) as in exercises or games.

2. *Indirect Causes.*—(*a*) Trauma applied at any point lateral to the spine with accompanying hyperflexion regardless of whether or not one extremity of the body is fixed and the other movable. But, more likely to occur, if one extremity is fixed and the other movable, because, under such conditions *hyperflexion* is more marked.

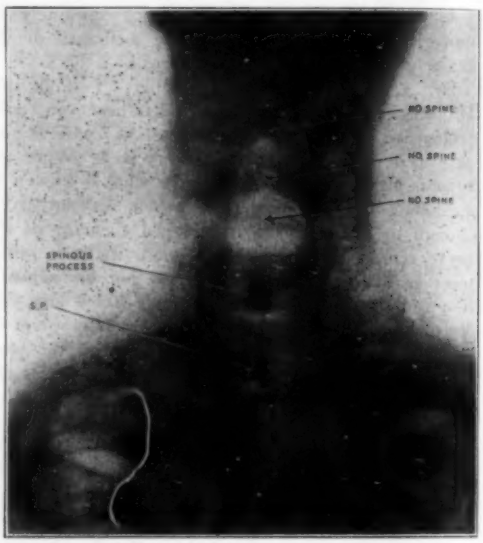

Fig. 1. Radiograph in Case of Spinous Process Fracture.

(*b*) Trauma applied directly at any angle to the spine over a spinous process, or processes, without causing any fractures directly, but with an accompanying *hyperflexion* that produces spinous process fracture, or fractures, from the extreme concomitant muscular action, at a higher, the same, or a lower level. This also is more likely to occur if one extremity is fixed and the other movable, for the same reason as given above.

3. *Mixed Causes.*—(*a*) Trauma applied directly to the spine over a spinous process, or processes, fracturing one or more spinous processes with a production, from the applied force

*Read before the Chicago Academy of Surgery, Oct. 28, 1914. Also before Chicago & Alton Railroad Surgeons meeting, Kansas City, September.

of the impact, of a *hyperflexion* which by its causation of extreme muscular action produces spinous process fracture, or fractures, additional to the ones caused by the direct external violence. This also is more likely to occur with one extremity fixed and the other movable.

There is no attempt to compare the relative percentage of such fractures with reference to their cause. From a survey of the reported cases, however, the large majority appear to have been caused by direct violence; the minority, due to indirect causes, but with no special effort to classify or describe the application of the force.

In the mixed causes, as I have called this sub-head, I am unable to find any recorded case explained on this basis.

If we eliminate the direct causes, which are most common, and consider only the indirect and mixed causes, we cannot help but note that *hyperflexion* beyond the physiological limit, is the real factor that produces spinous process fracture, or fractures, regardless of the applied force, and also regardless of whether or not one extremity of the body is fixed and the other movable, but most likely to cause this lesion when one extremity is fixed and the other movable. This predisposition to such an injury is further aided by the anatomical fact that the thoracico-cervical and thoracico-lumbar junctions are the unions of flexible and rigid parts and such lesions are, therefore, most frequent at or near these spinal levels.

Pathology.—The pathology of such an injury shows merely the fractures of the spinous processes in question with the accompanying evidences of traumata of the surrounding parts depending upon the severity of the initial applied force. The case I wish to report occurred on June 30, 1913.

Upon arriving at the scene of the accident, I found a strong, muscular man lying upon the ground complaining of considerable pain between the scapulae. This man was fully conscious and able to move his extremities.

Examination showed the presence of a small circular ring about one and one-half inches in diameter lateral to and at the level of the fifth thoracic spinous process. The skin forming the circle was seared and brown, as if by an actual cautery. The skin between the line forming the circumference of the circle, as well as that of the remainder of the posterior surface of the back, was of ordinary color and showed absolutely no evidence of injury. This circle was located with its outer edge over the vertebral margin of the scapula and the inner portion of its circumference over the underlying muscles between the vertebral margin of the scapula and the spinous process at this level, but lateral to the spinous process in question. There were no signs of any fracture of this scapula elicited by examination or subsequent radiographs. There were, however, signs of spinous process fractures in the middle thoracic region.

Subsequent operative procedure the same day showed that the 4th, 5th, 6th and 7th thoracic spinous processes were completely movable and torn off of their respective vertebral bodies. There were no accompanying lesions whatsoever. The patient pursued an uneventful recovery without any complications or sequelae and within two months was able to return to his usual employment.

The history of the manner in which this injury was sustained illustrates fully the role that *hyperflexion* played. This patient was sitting upon a box in the open air eating his lunch at the instant he was injured. He was, naturally, sitting in a half stooping position. A piece of iron pipe 30 inches in length and one and one-half inches in diameter was accidentally dropped from the eighth-story window of an adjacent building, striking this man, end-on, over the vertebral margin of the left scapula, and the forcible, sudden impact, taking him as it did unawares, caused a natural hyperflexion of his spine in a partially voluntary as well as involuntary effort to overcome the applied force. The logical and actual result was the production of an extreme and exaggerated *hyperflexion*, which, aided by the increased strain on the attached muscles and ligaments beyond their physiological limits, and owing to the fact that this man was a strongly muscled individual, caused these spinous processes to be torn directly from their respective vertebral body attachments.

This case, while it comes under indirect causes, sub-head (*a*), shows most markedly and clearly, excluding direct causes, that, hyperflexion, by whatever means produced or induced, is practically the last etiological word in the causation of such injuries.

Argo, Ill.

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TREATMENT OF HYPO-THYROIDISM.*

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CHICAGO.

Hypothyroidism is a constitutional affection due to the loss of function of the thyroid gland, characterized clinically by a myxedematous condition of the subcutaneous tissues and mental failure, and anatomically by atrophy of the thyroid gland.

Cretinism as a form of mental defect was written about many years ago, even before the slightest suggestion of glandular inactivity was mentioned. Schiff in 1859 noted certain physical symptoms following the removal of the gland in a dog. In 1869 Dr. Hilton-Fagge published a paper on cretinism in this country, and mentioned that the thyroid was small but laid no stress upon it. Before this time it was not generally known that there were cretins among us. In 1873 there were 120,000 cretins in France.

Gull in 1873 called our attention to a syndrome in adult women similar to cretinism and called it a cretinoid state. Dr. W. W. Ord a few years later suggested the name myxedema. In 1883 Kocher reported cachexia strumipriva following thyroidectomies. Since then many experiments on animals have shown that a certain complex follows removal of the thyroids and additional symptoms when the whole thyroparathyroids are removed.

When the disease occurs in young children it is called cretinism and when appearing first after the fifth year, juvenile myxedema; when occurring in adults it is spoken of as myxedema. Recently Hertoghe of Antwerp has called our attention to a mild form of thyroid weakness which he terms "the social form" because the patient is able to mingle with society. This is undoubtedly the "Myxedema Fruste" of Reverdin.

In the juvenile type alcoholism, tuberculosis and lues are strong predisposing factors. Cretinism occurs endemically and sporadically. In the endemic form it is supposed that some chemical substance or microorganism peculiar to waters of certain regions invade the host. Nothing is known of the etiology of the sporadic form. Sajous writes of an auto digestive process, the area so produced replaces normal tissue, but a fibrous tissue, resulting in cirrhotic atrophy which sooner or later annuls the function of the organ.

Myxedema occurs more frequently in women over 40, who have had a number of pregnancies or prolonged lactation periods.

Morbid Anatomy—In many cases there is a complete absence of the gland. In health a normal gland weighs 30 Gms; in disease, they may shrink to 3 and 4 Gms. In the young it is 1-300 of body weight, in adults 1-1800.

It has further been found on post-mortem that the heart muscles show infiltration, the liver cells swollen, the brain, lungs and spleen congested, parenchymatous infiltration of the kidneys, genitals atrophic, hypophysis enlarged; in fact, there is a parenchymatous infiltration of all organs.

Esser in 1907 found the bone marrow to be fatty and inactive, perhaps resulting in the anemia of hypothyroidism.

Both smooth and striated muscles show marked infiltration, the former giving rise to intestinal distention resulting in the frog belly symptom of all cretins.

The chain of symptoms of cretinism have been repeatedly demonstrated by thyrodectomizing animals, in families, where certain members were retained as controls.

Symptoms—In the congenital form the disease is not detected as a rule until after the sixth month. In the very young babies the earliest and only sign very often is the protruding tongue. Deficient oxidation manifests itself in physical and mental retardation. The child shows a pugginess, large tongue, open mouth, delayed mentality, laxity in muscle tone, cretinous appearance, thick lips, dry skin, scanty hair, and as time goes on a delay in speech and walking is noted. Dentition is slow and irregular, and a prominent abdomen is conspicuous. The temperature is frequently subnormal and a chilly feeling even in summer time is complained of; urine is diminished. Constipation is the rule. In cretins the genitalia are infantile. In adults menorrhagia is common. "If we can put aside such causes as fibroids and cancer, we will always think of thyroid deficiency." Headache and pain in the back are frequently complained of. The mental state is indicated by migraine, vertigo, hallucinations of hearing and melancholia, slug-

*Read before the Englewood Branch, Chicago Medical Society, January 4, 1915.

gishness to complete stupidity is often manifested. Some writers have characteristically stated there is a lack of growth in the longitudinal, but not so marked in the horizontal.

Wenzel has classified the mental state into:

1. Cretins: Those who are unable to speak, purely vegetative.

2. Semi-cretins: Those with limited language.

3. Cretinoids: Those who have some intelligence.

4. Mongolians: Those who have intelligence but do not yield to thyroid treatment.

This classification is rather crude and since the Binet Simon scale a better grading is possible. The mongolian, it has been found, never grades over five years, although the chronological age may be twenty, etc.

As before stated, the myxedema of Gull usually begins after forty. The urine is usually negative with the exception of a slight trace of albumin in some cases; anemia is present, the erythrocytes are diminished. An increase in weight is a common finding.

Once a case is seen the diagnosis is not so difficult.

In infancy fetal rickets and mongolism must be excluded.

In adults, nephritis and cardiac disease must be ruled out.

Prognosis (If left untreated): The cretin becomes a mental defective and a physical dwarf.

The adult gradually fails from the disease and dies usually from tuberculosis, pneumonia or cardiac insufficiency.

A clear picture must be kept in mind as to the factors at play to appreciate the result of treatment. They may be classified:

1. Deficient tissue oxidation, the rate of metabolism and nutrition in all tissues particularly those rich in phosphorous being retarded.

2. Deficient breaking down and carrying away of waste products, i. e., fats, etc.

3. Deficient resistance of the body to infection and intoxication.

In order to reconstruct these deficiencies, various remedies in times past have been tried, but to no success until special medication was discovered.

Schiff in 1884 first transplanted thyroid gland into the peritoneum of dogs, to relieve myxedematous symptoms, with startling temporary results.

G. R. Murray in 1891 advanced thyroid extract with glycerin hypodermatically.

Hector McKenzie and Horwitz in 1892 gave thyroid extract by mouth with good results.

Other workers have tried thyroid extract per rectum and still others advise administration of inunction with lanolin cream base.

Baumann in 1896 isolated iodin in the thyroid and called it thyroiodin.

No drug has worked greater miracles than the administration of thyroid in hypothyroidism. It is perfectly marvelous to review the results that have been accomplished. Children rapidly on the road to perpetual care in an institution are spared to richer mental attainment and a place in society. Adults condemned to death because of mistaken diagnosis of nephritis are saved to continue their chosen fields of labor and usefulness. The results have been so startling that a number of physicians have reviewed their old records, for cases with a symptom group similar to the myxedemas and spent time and money to acquaint those so afflicted and yet living, with the benefits to be derived from the special medication now known.

During the first week of treatment, quiet and rest are very essential. Wine, beer and alcohol in any form, as well as tobaccos, should be prohibited. The constipation should receive careful attention; the elimination should be increased by soap or glycerin enemas 2 to 3 times per week and a saline laxative by mouth; these can be alternated. The hypothermia may be combated by massage, warm baths and an equitable climate. Patients do better in warmer weather. Precautionary measures to prevent deformity from the rapid bone growth must not be overlooked. The earlier the treatment is begun the greater the good obtained both physically and mentally. After maturity the special treatment does very little good in cretins. If instituted early a normal healthy child will result; if otherwise, one more will be added to the waiting list for admission to an institution for defectives. Procrastination of special treatment, in these cases, is criminal.

What has been said of juvenile myxedema applies as well to adult myxedema. By the administration of thyroid it is possible to increase the absorption of oxygen from 20 to 75

per cent. Osler and McCrae state the increase of the combustion may be as high as 15 to 20 per cent.

The thyroid when given may be stored in the thyroid gland or added to the circulation at a time precisely as if the thyroid and parathyroids had secreted it; this is a general supposition. The normal thyroid contains but 0.3 and 0.4 per cent of iodin protein substance.

Thyroid is best given in tablet or powder form. If any difficulty in taking tablets is had they may be given in milk, wine or soup.

Initial dose: Infants, ½ gr. daily. Those 2 years old, 1 gr. daily. Adults 2 grs. daily

If raw sheep's gland is used begin with ⅛ of a gland a day and increase the dose gradually until 2 glands are taken, spread on bread or give with rice or milk. Thyroid is best given at meal time.

The beneficial effects increase the sensitiveness of all living cells and sustain by direct stimulation the functional activity of the latter, causing an increase in metabolism, nutrition, also stimulation to the cerebrospinal system because of its richness in phosphorous; it increases the mammary secretion and relieves menorrhagia.

In growing children syrup of calcium lactophosphate **U. S. P.** 3ī or less, according to age, is a useful adjunct.

To prevent recurrence, 1 gr. at bed time for children is necessary.

In adults, 2 grs. at bed time prevents recurrence of symptoms.

There are no bad effects from continuous thyroid treatment. Persons relieved by medication are as capable as those who are the happy possessors of a thyroid factory in their own bodies. In a case of Leopold Levi and De Rothchild where thyroid failed to act, pituitary extract 1.5 grs., which is equivalent to 7 grs. of the fresh gland, was given and marked improvement appeared within a few days, especially mental. Other cases have since been similarly benefited. The improvement is much more marked in sporadic cases than in the endemic.

Thyroid extract in 5 grs. doses is toxic and exaggerates the metabolic condition and loads the blood with pathogenic poisons; untoward effects are also produced by small doses too frequently given. The effects are manifested by fall in blood pressure, by tachycardia, restlessness, insomnia, muscle pain and weakness, rapid emaciation, lowering of oxygenation, nausea, vomiting and diarrhea and pronounced mental symptoms, in fact a syndrome of Basedow's disease is presented. It is unnecessary to cause the absorption of more than 3½ to 5 ounces of infiltration per day.

Various preparations of thyroid are placed on the market by different manufacturers.

Parke, Davis & Co. have a preparation called by Beebe Thyroprotein, supposed to contain the active principle of the thyroid gland. It increases oxidation, relieving disturbances of nutrition such as cretinism and myxedema. It is put up in 2 gr. tablets of 1 to 5 per cent. strength. It is less toxic than thyroid extract.

The 1 and 2 per cent. tablets are used almost entirely in the treatment of various forms of goiter.

The strong 5 per cent. tablets are reserved almost exclusively for different metabolic disorders, such as various skin lesions or joint conditions, myxedema, cretinism, etc.

Armour & Co. have standardized thyroid extract in the form of a powder and tablet of 1 and 2 grs.

Each 2 gr. tablet contains 2 grs. of thyroid extract and 3 grs. of excipient.

One grain of thyroid extract is equivalent to 5 grs. of fresh normal thyroid gland.

The standardization is 0.2 per cent. iodine content.

The Bayer Company have marketed Baumann's product known as Iodothyrine (Thyroidine). It is the chief active principle of the gland. It is supplied in powder and in 3-gr. tablet form.

Doses: Children, 3-12 grs. daily, better tolerated by adults. Adults, 6-18 grs. daily.

It is rapidly absorbed; 15 grs. are equal to 15 grs. of thyroid extract.

Knoll & Merk Co. placed on the market Thyraden, a stable thyroid extract containing the natural iodoproteid compound of the fresh gland.

Dose is two tablets of 2½ grains each (equaling 5 grs. of the fresh gland) from 3 to 5 times daily. For children, ½. The tablets are intended to be masticated. Oswald's Thyroglobulin and Fraenkel's Thyroantitoxin have also been tried.

In view of the fact that thyroid medication

must be continued throughout life, transplantation of thyroid is again absorbing the interest of the surgeon.

Christiani of Geneva states that only normal living tissue is to be used; numerous grafts about the size of a grain of wheat to be inserted in very vascular subcutaneous cellular tissue and that only human thyroid be used. The tissue can be kept alive one hour in normal salt solution, cut with a sharp instrument. They then are introduced in situ, where they gain a perfect foothold, becoming perfect thyroid parenchyma in fifteen months; they not only live but grow.

Recently sheep's thyroid has been transplanted in the human with good results. Christini found the most striking results to occur in the various types of cretinism. Special educative measures also benefit cretins.

Case 1, Helen T., age 10 years; father, alcoholic, luetic; mother, tubercular, luetic; brothers and sisters: Margaret, died at 9 months of age, pneumonia, mentality not known; John, died 1 year of age, pneumonia, mentality not known; Helen, now 10 years old, cretin; Joseph, died 7 months of age, dropsy; George, died at 4 years of age, pneumonia, mentality not known; Robert (baby), now 3 years old, cretin.

Helen came under observation April 26, 1913, and was diagnosed congential cretinism with lues. Height, 3 feet 5 inches; pulse, 120; respiration, 28; weight, 44½ pounds.

Patient could hardly walk; at 8 years of age stunted longitudinally and mentally very stupid; speech blubbering; could not be sent to the store; face puggy, protruding abdomen, thick tongue, would suck her food; short stubby fingers; always felt cold, even in summer time; hair thin and scanty, skin dry and anemic, saddle nose, teeth decayed early, fontanels closed late, mouth open, jelly-like swelling in subcutaneous tissues, slit eyes, heavy lids. They did not want to take her in school and told me to send her to Lincoln Institution for the Feeble Minded. "She was so bad I felt ashamed to take her out on the street. She would drop her head on her chest like it was too heavy and was alwayes tired. I always had to give her something for her bowels." Another child was born before Helen could walk.

She was placed on thyroid and protiodide of mercury and in two weeks marked improvement was noticed, which has been continuous ever since. She now goes to school and is in second grade, her articulation is better, the face shows more expression; she is anxious to acquire knowledge. The subcutaneous jelly-like swelling has mostly disappeared. She has gained 7¾ inches in height and 16 lbs. in weight, her hair is growing nicely, she is not nearly as constipated, her tongue is not so thick. In addition to the thyroid medication, she is receiving Elixir Calcii Hypophosphites. She is very playful and happy. She can be sent on errands and assists her mother in various chores—all this improvement in a little over one year of medication.

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SUMMARY.

Watch for the incipient cases, make an early diagnosis and give small initial doses and proceed slowly.

"Just as we search all our patients for tuberculosis, syphilis, alcoholism, a day will come when a systematic examination will also be made to ascertain their thyroid powers and defects."

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THE REPORT OF TWO CASES OF THE IMMEDIATE TRANSPLANTATION OF BONE IN COMPOUND COMMINUTED FRACTURES OF THE TIBIA AND FIBULA; THE BROKEN FRAGMENTS WERE USED FOR THE TRANSPLANTS; WITH EXHIBITION OF PATIENTS AND SKIAGRAMS.*

FRANK BYRNES, M. D.,
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In reference to the two cases which I am about to report, I have searched the literature quite thoroughly and thought I was a pioneer in the successful immediate transplantation of bone where the broken fragments of the bone it-

*Read before the North Shore Branch, Chicago Medical Society, February 8, 1915.

self were used for the transplants. I find, however, Dr. Walter S. Barnes of this city antedated me by about two months from the date of the report of his case which appeared in the October number, 1914, of *Surgery, Gynecology and Obstetrics.*

These two cases are interesting, unique and instructive in showing what can be accomplished by the conservative management of fractures of this character, where there is a marked comminution and destruction of the long bones for several inches, by the immediate retransplantation of some of the broken fragments and keeping the wound sterile, the limb properly immobilized and extended to overcome muscular contraction. There is nothing to be lost by the experiment of bone grafting, and if properly done, under strict asepsis, there is everything to be gained. I think we are just beginning to realize the great recuperative power of bone to reform itself after partial destruction, and it should be our aim as surgeons to aid Nature in every possible way, such as grafting of bone, saving the periosteum, properly immobilizing the parts, etc. If we fail in our immediate effort, later we can, after the parts are healed, take a transplant from the other tibia and try it over again. Failing in this, we have the choice of a short limb or an amputation.

Case 1. Patient, John M. Thornton, aged 30 years, was admitted to my service in Columbus Hospital, November 9, 1913. Family history negative. Had the diseases of childhood; married. Present trouble: November 9, 1913, while in the employ of the Chicago Telephone Company, was riding a motorcycle and collided with a heavy seven-passenger automobile. Both machines were going at a good rate of speed. Mr. Thornton was thrown about thirty feet and was brought to the Columbus Hospital. A bandage of cotton cloth was tied around the thigh above the knee, including trousers and drawers, to stop bleeding. No effort had been made to protect the open wound with sterile gauze from coming in contact with his clothing. On removing the temporary tourniquet and clothing quite free bleeding started, and I applied the proper tourniquet again.

The right leg presented an ugly appearance about four inches below the knee. The leg was crushed for about five inches; there was a large gaping wound on the anterior surface for about four inches through which fragments of bone were protruding. There were also several smaller openings on each side of the larger opening through which bone fragments were protruding. Pieces of the clothing were ground into the wounds, giving ample cause for infection.

I immediately painted the wound and the surrounding surface with tincture of iodin and had the patient more thoroughly prepared for operation. Fearing the possibility of tetanus, I gave 1500 units of antitetanic serum hypodermically, and repeated the dose next day. The radiographer was not in the hospital at the time, so no skiagraph was taken before the operation.

On examination, after being anesthetized, it was a question what to do with the leg. The tibia was literally smashed to pieces and pulpified for about five inches, giving no support to the formation of the leg. The lower part of the leg and foot could be rotated in any direction like a flail joint. I enlarged the opening upward and downward parallel to the line of the tibia for about five inches, trimmed off the traumatized edges of the skin, and removed the broken fragments of bone with tissue forceps and placed them in a normal salt solution. I had decided by this time, if I could find a piece of bone long enough, I would try and graft it between the ends of the broken bones. I removed all the fragments and put them in the normal salt solution. I only got one piece of any size and that will show in the skiagraph. It was from the outer layer of the compact bone of the tibia, four inches long; its width tapered from a point to half an inch at its base, its thickness being about one-quarter of an inch, merely the outer shell. It was denuded of its periosteum. In removing the loosened pieces of bone I found a shell of bone with its periosteum intact, about five-eights of an inch wide and about one-quarter of an inch in thickness, broken from the bone above, but held loosely in place by the periosteum, and extending downward about one and one-quarter inches. This was primarily the outer or dense layer of the posterior part of the tibia. I also found a similar piece extending upward from the lower end of the fractured bone. This also was broken from its attachment to the tibia below, but was held loosely in place by its periosteal attachment. The distance between these two fragments was about two and one-half inches. I examined the fragments, found and removed a piece similar to the two remaining fragments just described. It was a shell from the outer surface of the broken bone, about two and one-half inches long, three-quarters of an inch wide and about one-quarter of an inch in thickness, with intact periosteum. I decided to graft this piece between the two pieces of bone just described. To the lower fragment I attached it with a silver wire; to the upper fragment I attached it in two places with silver wire and kangaroo tendon. This made a continuous shell of bone on the posterior and inner aspect of the tibia. I decided also to use the long splinter of bone as an additional transplant and also as a splint to assist in holding the bones apart and in place. The smaller end of the transplant I put into a wedge-shaped cavity in the lower end of the upper part of the tibia, posterior and to the outer part of the bone (shown nicely in the lantern slide). The lower end of the transplant I fitted into a shallow notch on the upper end of the lower fragment, on its posterior aspect. I secured this by winding kangaroo tendon about the transplant and lower fragment of

bone. It will be observed that both of these transplants were attached to the posterior aspect of the tibia and none connecting with the medullary portion of the bone. This left a cavity five inches long and the size of the upper end of the tibia. I now removed the tourniquet to look for hemorrhage. There was free oozing but no spurters. I could not detect pulsation in the anterior tibial artery. I made no effort to ligate any of the bleeding points, but packed the cavity carefully but firmly (so as not to displace the transplants), layer by layer, with iodoform gauze, from the bottom of the cavity to the top; and plain sterile gauze dressing applied over this. Adhesive strips were applied to the sides of the leg below the fracture for the purpose of extension. The leg was then put in a moulded fenestrated plaster cast extending above the knee, with foot-piece and the proper extension applied when returned to bed.

The first few days the outer dressings were freely saturated with sero-bloody discharge and were changed twice daily. I do not consider free oozing a detriment in cases of this kind, where there naturally is considerable handling and the wound open to infection from the time of injury. The iodoform inhibits the growth of germs and the free edudate carries them to the surface, if any have gained entrance. The wound remained sterile during the course of repair. Temperature never ran above 99 degrees, and after the fifth day, it was normal and remained so; pulse never exceeded 88. After one week I started to remove the iodoform gauze packing gradually, a little every day. It was three weeks before the last of the packing that was originally put in was removed. The gauze had remained sweet and clean. Healthy granulations were lining the walls of the cavity, and it was gradually closing in. I did not allow the cavity to close in rapidly, or allow the skin to grow down over the ends of bones and inhibit their growth, by acting as a limiting membrane. I kept the cavity well packed all the time with sterile gauze, which was changed daily. This was continued until the cavity was filled by growth of bone from below and from the ends of the upper and lower fragments. The fibula was broken transversely in one place at about the level of the lower fragment of the tibia. It came into position when the leg was extended and nothing was done to it. The patient was restless and twisted about considerably in bed, so it was difficult to keep up the proper extension. Realizing the leg must be kept immobilized, extension continued for several weeks, and nutrition maintained. I concluded these three conditions could best be met by the application of the ambulatory pneumatic splint. It was applied the thirty-fifth day after the injury. The patient was up and around from that date with leg properly immobilized and extended, enjoying the pleasure of walking about with no discomfort. The wound is easy to dress with the splint on and extension can be increased at will. The results in this case, which are largely due to the assistance of the ambulatory splint, and the comfort it gave the patient for the following two months when the bone grafts were uniting, justify me in endorsing all the good things said about the splint.

The leg is in perfect alignment with three-quarters of an inch of shortening. He was able to resume his former occupation of telephone line work after a lapse of ten months. I think if an earlier application of the pneumatic splint had been applied, the shortening of the leg could have been avoided, and the patient suffered less discomfort.

A series of skiagrams was taken. The last one, December 24, 1914, about thirteen and one-half months after the injury, showed that firm bony union has formed between the ends of the broken fragments.

Case 2. Andrew Westerberg, aged 26 years; single, no previous sickness. Employed as laborer in Lincoln Park.

History of accident: March 30, 1914, while working in the lagoon of Lincoln Park, transferring heavy timbers from a larger to a smaller boat alongside, he was descending to the small boat, had the left foot on the small boat, and was drawing the right leg across the rail of the large boat preparatory to alighting, when a heavy timber twelve inches square and sixteen feet long, dropped and caught his leg between the timber and the rail of the boat, about four inches above the ankle-joint, and produced a compound comminuted fracture of the tibia, comminuting about five inches of the tibia and severely lacerating the soft parts, spiculae of bone were protruding through the skin. The fibula was broken transversely at about the level of the lower part of the wound. The case was immediately transferred by the secretary of the park to my service in the Columbus Hospital. I assumed charge of the case on entrance. Wound was wrapped up with some muslin cloth and bleeding quite freely. Clothing removed, I could feel no pulsation in the dorsalis pedis artery. Tourniquet was applied to check hemorrhage. The immediate wound and the surrounding parts for some distance were painted with tincture of iodin and further prepared for surgical operation. Ether anesthesia.

On examination I found the ankle-joint not injured, but about four inches above the joint I found the tibia badly crushed for about five inches, and skin crushed and lacerated. The foot and the part of the leg below the injury hung limp and could be twisted around in any direction, so complete was the crushing of the bone. I removed a large splinter protruding through the torn skin and put it in normal salt solution. It was about four and one-half inches long, three-quarters of an inch wide and half an inch in thickness. It was denuded of its periosteum. After the removal of this piece of bone, I enlarged the lacerated wound upward and downward until it was about four inches in length. I trimmed off the edges of bruised and torn skin that might be infected be-

fore I proceeded to explore the wound further. On further examination I found the rest of the tibia for the distance of five inches badly splintered in the longitudinal direction of the bone. The splinters were lying in various directions and not attached to any particular part of the bone. I cleaned out all the loose fragments of bone and put them in salt solution for future use. My first case had encouraged me to do a similar transplant on this case. Besides the large piece of bone that was protruding and was removed before the incision was made to enlarge the opening, among the splintered fragments removed I found two pieces of bone, one about four and one-half inches in length, and the other about an inch shorter. They were about the diameter of a lead pencil and were from the outer or compact layer of the tibia. The periosteum to all appearances was removed from these two pieces also. The larger piece that was removed I returned, after smoothing the ends, to the locality from which it came, the inner and posterior part of the tibia. I wired this to the upper and lower fragments of the tibia with silver wire. The other two long splinters of bone I placed alongside the larger piece just transplanted and tied the three pieces together with kangaroo tendon, using three strands encircling each end and the center of the bundle. My reason for returning the two small splinters of bone was that they appeared to have some periosteum adherent to them that might aid in the formation of new bone.

The tourniquet was removed and free oozing took place. There were no large spurting arteries, however. I again felt for the pulsation of the dorsalis pedis artery, but could not detect it. Blood had filled in between the splintered bone transplant and acted as a good bridging material for the formation of new bone. The excess of blood was removed and the cavity packed as in the previous case, firmly, layer by layer, with iodoform gauze. Over this was applied sterile gauze firmly bandaged. I applied a moulded fenestrated posterior lateral plaster splint with foot support, and sufficient extension to overcome the muscular contraction.

The after care of this case was similar to the first. There was considerable sero-sanguinous oozing for the first week. Only the outer dressings were changed. On the eighth day I started to remove the iodoform gauze packing a little each day, and replacing what was removed of the iodoform gauze with plain sterile gauze, so as to prevent too rapid a closing of the soft parts of the wound. The last of the iodoform gauze packing was removed on the twentieth day after injury. The wound was granulating nicely. There was no pus. Temperature never rose above 99.4 degrees. The fourth day it was normal and remained so during convalescence. Pulse but slightly accelerated during first few days.

I experienced the same trouble in this case as in the first one in keeping the proper extension to the leg and the patient comfortable at the same time while in bed. I again decided to use the ambulatory pneumatic splint. His employers had to be consulted in regard to the rent of the splint, so it was the fortieth day of the injury before the splint was applied. He was out of bed and out of doors daily from this time on, with proper position and extension of his leg without discomfort.

The progress of this case and the first one were illustrated by the lantern slides of skiagraphs.

The growth of new bone in its behavior with transplants is interesting and hard of explanation. The lower end of this transplant that was firmly held to the tibia up to the time of its removal, did not, according to the skiagrams, show any evidence of new bone formation, although the end was replaced in the cavity from which it was displaced, giving every opportunity to supply the Haversian vessels with osteogenetic elements. The upper end of the transplant escaped from its firm apposition to the horizontal end of the tibia to its edge on the inside of the bone, yet in this position we find new bone developing, the transplant being gradually absorbed, and the new bone taking its place. The upper end of this transplant was freely movable under the tissue from the time it escaped from its original bed to its final removal. The question that arises is, did this transplant aid any in the reproduction of new bone, or was it the periosteum that produced it?

Dr. McWilliams, in the *Journal A. M. A.*, Jan. 31, 1914, page 346, lays great stress on the value of the periosteum being on the transplants, and secured in several instances reproduction of bone from the periosteum alone. Another interesting observation in connection with the transplants in this case is the non-absorption or the slow absorption of the long, slender, pencil-like fragment. In this skiagram taken seven months after the injury, it appears as much intact as when implanted. Dr. J. B. Murphy states that all transplanted fragments, large or small, are ultimately absorbed. This fragment appears intact in a later skiagraph. The absorption of these two fragments seem to follow in line with the views of Dr. McWilliams, that bone in contact with the soft tissues are absorbed much more rapidly than bone that is transplanted in the cavity of bone. The next skiagram, taken December 4, 1914, shows the new bone tissue giving a light shadow, but completely filling in the space from which

the remnant of the transplant was removed, and ultimately filling in the cavity between the upper and lower fragments of the tibia.

The next skiagram, taken December 31, nine months after the operation, shows a complete bony union between the ends of the tibia and also between the lower end of the tibia and fibula where it comes in contact with the new growth of bone. He is able to bear his weight upon it. The leg is in perfect alignment and is only one-half an inch shorter than the other leg. I feel in this case, as I did in the first case, that most of the shortening could have been avoided and the discomfort of the patient lessened by the early application of the pneumatic ambulatory splint. In neither of the two cases were the transplants placed in the medullary portion of the bone as is customary when the transplant is removed from bone, other than the one injured; on the contrary, they were grafted to the outer portion of the bone.

CONCLUSIONS.

From the experience gained in these two cases I have certain observations to make: 1. No long bone, especially of the legs or arms, should be amputated for fractures, no matter how much the bone is destroyed, if the blood supply is ample for the nutrition of the parts, without an effort being made at bone restoration by bone grafting or transplanting.

2. When a large cavity exists after the removal of destroyed bone for immediate injury, and there is free bleeding without any large spurters, and there has been considerable handling of the parts, pack with iodoform gauze and leave for a few days. It will stop the bleeding and help to prevent infection.

3. The sooner you get a patient with a broken leg or thigh up and about, provided you can keep proper extension and immobilization, no matter whether it is a simple, a compound, a compound comminuted, or a fracture where several inches of bone has been destroyed and a transplant substituted, a quicker restoration of the parts will take place owing to the better physical condition of the patient by being about. It was a physical impossibility to keep these two patients sufficiently quiet in bed with the proper extension required to keep the slender transplants in their proper places for the time required, hence, the shifting of the grafts as shown in the radiograph. This could have been avoided, in my opinion, by the immediate application of the ambulatory splint.

4. From the close observation of the radiographs in these two cases during repair, I am impressed with the important part the periosteum plays in the reproduction of new bone. Good authorities on bone work claim that equally good results can be obtained whether the transplant has its periosteum intact or not. A careful examination of the skiagrams does not bear out this claim in these two cases.

In my first case the transplant that was used was a mere shell of bone with its periosteum intact and the parts to which it was wired were the same. The result was the rapid reproduction of new bone to fill up the cavity. While the transplant that was denuded of its periosteum and when returned as a transplant fitted very snugly at its upper end into a notch in the lower end of the upper fragment of the tibia, failed to perform any osteogenetic function, as far as can be determined by the x-ray, the lower end of the transplant that became displaced outward against the upper end of the lower fragment of the fibula covered with periosteum, showed the formation of new bone.

A similar condition was observed in the second case. The large transplant denuded of its periosteum was returned to the location from which it came and was held firmly in its place by a silver wire. The close approximation gave every opportunity to the osteogenetic elements to perform their function, but the skiagram showed the formation of no new bone. The upper end of the transplant which was displaced from its firm contact to the shaft of the tibia, escaped to the periosteal border, being held in place by mere contact. Yet we see new bone following along as the transplant is gradually being absorbed downward.

The two smaller spiculae of bone that were used as additional transplants show growth of new bone only where they are in contact with bone covered with periosteum.

I am so impressed with the bone-producing properties of the periosteum that I venture the assertion that if one of the long bones, crushed

as these two bones were crushed, had all the spiculae of bone removed, wound kept sterile, properly packed and immobilized with sufficient extension, the bone would reproduce itself to its former shape.

FISTULA IN ANO.

FRANKLIN B. MCCARTY, M. D.
CHICAGO.

Fistula in ano is a deep sinuous canal about the anus opening either on the surface, into the rectum or in both places. In a great majority of cases it follows an ischio-rectal abscess but is also found in association with local or general tuberculosis, anal fissure, ulcerated hemorrhoids, carcinoma of the rectum or stricture of the rectum.

An untreated ischio-rectal abscess tends to point in one of three ways—externally, discharging on the skin surface, internally into the rectum, or in both directions. The tendency of such an abscess is to remain unhealed, due partly to insufficient drainage and backing up of pus, and partly to the constant movement of the affected parts. These abscesses may spread upward toward the pelvis, the process being most frequently located just beneath the rectal mucosa due to mechanical limitation by the levator ani, or, less commonly, may penetrate the pelvic fascia and extend to the pelvic cellular tissue, in which case the opening may be placed high up in the rectum, in the groin or over the hip. The abscess may spread around the rectum, sometimes nearly encircling it, and such a condition is known as a horseshoe abscess.

The abscess may continue to drain indefinitely or it may heal over on the surface for a time, subsequently breaking down and discharging. After a certain length of time the track of such an abscess becomes thickened and fibrous and the condition of fistula results. This may be incomplete, opening either into the rectum or onto the skin, or complete, opening both internally and externally and so forming a communication from the inside of the rectum to the skin surface. The track may be a simple thick-walled tube or, as is frequently found, a more complicated system of branches and diverticulæ. Several fistulous openings may be observed on the skin surface or in the rectum. When these occur on the surface they may be merely different openings of branches of one fistula, whereas multiple openings into the rectum usually indicate multiple separate fistulæ. The calibre of the track may be uniform or the cavity of the original abscess may persist. The walls of the cavity consist of fibrous tissue lined with pale granulation tissue. Whenever such an abscess exists with an incomplete fistula, any blocking of the canal leads to an acute inflammation and recurrence of the abscess.

In an external incomplete fistula the orifice of the track varies considerably in size and location. In the ordinary fistula the opening is small, often pin point in size and is located usually close to the anus but sometimes far out on the buttock, and from the opening project small reddish granulations. In the tuberculous form the opening may be the same as in the non-tuberculous except for a lack of granulations, or it may be large, irregular and sluggish in appearance, with a purplish edge and marked congestion in the surrounding tissues. The orifice in the internal incomplete type of fistula may be at any point between the anus and the internal sphincter, usually not above this level even though the sinus extends upward a considerable distance beneath the rectal mucosa. In the complete type the internal opening is frequently found between the external and internal sphincters. Sometimes the external opening is located on one side of the anus and the internal opening on the opposite side of the rectum, due to numerous and extensive branching of the track.

Diagnosis is usually easily made, although difficulty is sometimes encountered in following the entire course of the track and in determining whether it enters the rectum. Pain is frequently not present but the patient often complains of a sense of discomfort about the rectum. Acute pain occurs, as a rule, only when the entrance is blocked and pus has backed up, in which case symptoms of acute abscess appear. There is a constant or intermittent discharge of pus about the anus or from the rectum. This pus may be slight or profuse in amount and varies in character from the thin sanguinous discharge of a tubercular process to thick yellow material. Pas-

sage of feces or gas through the external orifice indicates an opening into the rectum.

Examination reveals an opening in the skin near the anus, sometimes concealed in a fold of skin, and from which a drop of pus may exude on pressure. The surrounding tissue is reddened and indurated. A fine metal probe when inserted into the opening and allowed to follow its own course without the use of force will indicate the direction of the fistula and by this means the extent of the track and its chief branches may be determined. The general direction of the main track is toward the rectum and in complete fistulæ the probe should enter the rectum, although sometimes the tip of the probe becomes lodged in a branch and the internal opening is not discovered. With one finger in the rectum the thickened and indurated track may be felt like a firm cord and the point of the probe may be felt just beneath the rectal mucosa. The internal opening may be found by using a rectal speculum or by inserting a strip of gauze into the rectum and injecting the sinus with a solution of methylene blue. The blue stain on the gauze will serve to locate the internal opening.

In the internal incomplete type of fistula one notes redness and induration and a feeling of resistance of the skin about the anus, and by use of a speculum pus may be seen to exude from an opening in the rectal wall. Digital examination reveals induration and sometimes tenderness at the site of the lesion.

Treatment of fistulæ depends largely on the type of lesion. Non-operative measures include injections of stimulant or antiseptic solutions and the application of caustics. Bichlorid, nitrate of silver and iodin are commonly employed and it is not unusual to see cases treated in this manner for months with no apparent progress toward recovery. Very few cases tend to heal spontaneously and such as do are small in extent and healing occurs only after a considerable length of time. Recovery in such cases is usually due to improvement in the general health of the patient, and systemic treatment is most important in every instance, particularly in individuals who have a tuberculous process elsewhere in the body. Fresh fistulæ following recent abscesses offer the greatest promise for healing with non-operative treatment, and under the stimulation provided by occasional probing and the use of mild antiseptics healthy granulations may appear and healing results. In such cases it is often necessary to enlarge the opening of the track so as to permit free drainage and subsequently it is important not to allow union of the skin edges to block the passage and prevent the escape of pus.

Of the operative measures the one usually employed in cases which are not suitable for expectant treatment is to lay open the entire track, dividing the sphincter if necessary, and allow the wound to heal from the bottom by granulation. If the fistula is incomplete the main track and its branches are laid open, the walls curetted and the wound loosely packed. When the fistula is complete, a probe is passed into the bowel through the sinus, the tip brought out of the rectum and the bridge of tissue, with sphincter included, is divided. The branches are laid open, the wound packed and allowed to heal from the bottom. This operation while rapidly performed, has the fault of leaving a large gaping wound to granulate and of endangering the sphincter muscles unnecessarily in some cases. It is indicated where a considerable part of the old abscess cavity still remains or where there is an encircling track around the rectum.

In many cases the fistulous track is narrow throughout and though it may branch and extend in many directions, no cavity of any size persists. Such cases may be treated by excision of the entire fistulous track with suture of the parts without drainage. This shortens the convalescence and does away with painful and irksome dressings and, most important of all, allows the patient to be up and about sooner and with greater comfort than any other method. The method of procedure is to have the patient thoroughly prepared with cathartics and enemata until the return wash is clear, and under complete anesthesia to stretch the sphincter until it is fully dilated. The fistula is then probed and an attempt made to find the internal opening but no force is used, as a false passage may be easily made. If the internal opening cannot be made out by probing or with a speculum, the rectum is packed with gauze, and methylene blue solution is injected through the external

opening, only a few c.c. being required. On removing the gauze the blue stain serves to locate the internal opening. An incision is then made with a sharp knife around the external orifice of the fistula and with a probe inserted one-half to one inch, the fistulous track is dissected out, keeping the probe inserted a short distance ahead of the dissection all the time. Care must be taken to remove all of the ramifications of the track and these can be located by means of the probe, the blue stain, and by the characteristic whip cord feeling of the track. The sinus must be followed to its end in all directions until it finally leads into the rectum. At this point it is advisable to make a buttonhole incision around the internal opening and to remove a small piece of mucosa with the inner end of the fistula. The rectal wall is then closed with interrupted fine linen sutures and after securing all bleeding points the wound may be closed with buried catgut sutures and silkwormgut skin sutures without drainage. The sphincter muscles are often undamaged by this procedure but when it is necessary to divide them it should be remembered that only one incision should be made and that the muscle fibres should be divided at right angles to their course.

A morphia and belladonna suppository is then inserted into the rectum and a dry sterile dressing and T binder applied. A liquid diet without milk is given for four days and a suppository containing one grain of iodoform is inserted night and morning. The bowels are kept closed with deodorized tincture of opium as required during the first four days and at the end of that time an ounce of castor oil is given in the evening and an oil enema is carefully given on the following morning. After this the bowels are moved daily with compound licorice powder which produces a soft non-irritating movement. After each movement the area around the anus is cleaned with warm boric solution, thoroughly dried and powdered with boric acid. The patient is allowed to be up on the fifth day and the diet is increased at that time, care being used not to use a diet which leaves a bulky residue until the wound is firm.

This method has given very satisfactory results and the convalescence has been greatly shortened and the personal comfort of the patients greatly increased. It gives an opportunity of getting the patient into the open air and of applying the general hygienic and constitutional measures so necessary to prevent recurrence of the condition.

Safe Milk for Baby.
With apologies to the author of Tipperary.
A·S·O·N·G·F·O·R
C H I C A G O ·
"It's a long way To cleanly dai-ries
It's a long way to go It's a
long way to cleanly dair-ies. To the
saf-est milk we know!"—
"Fare-well To old time methods
Welcome to standards fair It's a long, long
way to cleanly dairies. But our goal's right
there!" "It's a there!
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By Dr. G B Young

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MARCH, 1915.

Editorials

CHICAGO'S MUNICIPAL TUBERCULOSIS SANITARIUM.

On February 16 the city of Chicago dedicated a great institution in which to fight the greatest scourge of mankind—The Chicago Municipal Sanitarium.

This institution, which is probably the finest and best equipped of any in the world of its kind, was made possible by the Glackin Law, and was realized because of the untiring energy of Dr. Theodore B. Sachs, whose persistent efforts finally overcame the many obstacles to be met in the engineering and building of such an institution.

It will now be possible for the tuberculous poor of Chicago to have as efficient treatment for tuberculosis as may be obtained. The value of this institution to the people cannot well be estimated. It will add many years to the average life of the tuberculous of Chicago, but far greater than this will be the benefits derived by the municipality in the prevention of contagion from this formidable disease.

There are, in connection with the Sanitarium, ten dispensaries, located in the crowded sections of the city, where are examined, diagnosed, and treated tuberculous patients—of all stages. Many of the patients now treated by these dispensaries will be transferred to the Sanitarium, where a more efficient treatment may be given, and where the patient will have a better chance to regain his health and thus may again be a bread-winner.

The building of this institution is the first real effort of a municipality in Illinois to eradicate this disease, and the citizens of Chicago must be congratulated upon its achievement.

The Sanitarium is now open and patients will be received as fast as is possible.

A NEW DEPARTMENT.

With this issue we are starting a Department of Public Health. In it we will give the news items pertaining to health matters of the state and also try to keep the profession informed on the activities of the State Board of Health, as well as on legislative matters pertaining to the same subject.

We have always believed there should be a closer co-operation between the profession and the State Board of Health, and we know that the profession should have a better knowledge of the activities of the State Board than it has had in the past.

EFFICIENT QUARANTINE.

The Illinois State Board of Health has recently adopted a revision of the rules on quarantine. It has enlarged the list of quarantinable diseases, and insists on the enforcement of quarantine in all its details.

Efficient quarantine is the most potent factor in stamping out communicable diseases. Efficiency depends upon the rigid enforcement by the State Board of Health of the rules and regulations it adopts that are in accordance with the statutes. And the statutes authorize the State Board of Health to exercise such police powers as may be necessary to secure the efficient enforcement of its rules. However, the board does not desire to work hardships on the citizens, and seeks their hearty co-operation in the enforcement of its rules and regulations. And there is no speedier method of securing this co-operation than educating the people that efficient quarantine means the saving of human life, the relief of suffering and lessening the cost of living.

And the State Board of Health, also, realizes that the doctors in every community should be the leaders in insisting on efficient quarantine. They should be foremost in educating their clientele as to the advantages of quarantine, and they should realize that their opinions on medical questions are, or should be, accepted as authoritative by the people. They should, also, realize that the prevention of disease means increased wealth in a community, and that indirectly this will be to their own financial advantage.

The progressive physician, city or country, is the man who will engage his activities in all the medico-sociological problems of the day. He will be the leader in all movements which tend to the betterment of medical conditions, and the State Board of Health will welcome the co-operation of the rank and file of the profession, and will assist in every possible way in the campaign of popular education.

When it has been necessary for the State Board of Health to assume the responsibility of maintaining quarantine, the communities have been quick to see the beneficial results, and instead of opposing quarantine have demanded that the law be rigidly enforced. As an example, the recent epidemic of scarlet fever at Decatur could not be controlled by the local board of health, for various reasons, and the state assumed control, and after rigid quarantine was established the epidemic quickly subsided. Here the medical profession and the layman co-operated heartily, and were pleased with the results.

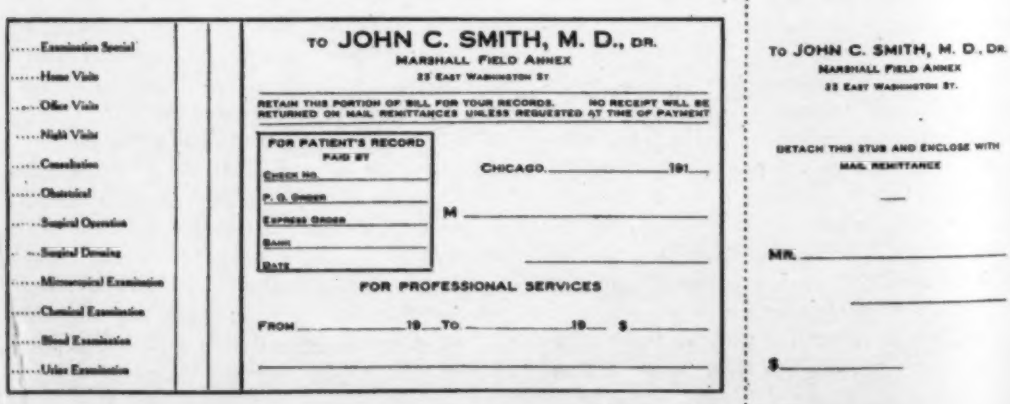
TIME IS MONEY.

As trite as the old saying may be, it does not appear that there are many physicians who appreciate that time is money as might be the case. Too often is there a feeling to let well enough alone, rather than one which prompts an exercise of energy or inventive faculty to cut down the time required for a given job, and thus obtain better results.

In the commercial world corporations have what is known as efficiency engineers whose time and brains are devoted to devising ways and means for reducing operative expenses and at the same time maintaining if not actively promoting efficiency. To illustrate: one of Chicago's public service corporations having a million subscribers saves thousands of dollars monthly in the item of postage alone because of an operating system which makes it unnecessary to return receipts (for mail remittances) for bills rendered.

Today practically all big corporations have perforated bill heads unequally divided as to length of stub. On the longer portion of the paper appear the headings for itemizing the account, this slip to be retained by the party remitting. On this slip may be noted the manner of paying the account, as for instance by check, draft, express or postoffice order, date, etc. On the short slip will appear such items as the company may see fit to insert, its purpose being for identification of the account. It is to be torn off and returned with remittance.

Physicians might with advantage adopt similar methods of bookkeeping for economic reasons alone, to say nothing of the many other advantages. Think of the thousands of dollars in the item of postage alone that may be saved to the families of medical men if such a system were universally adopted by the profession. Thus far we have not taken into consideration the much


.....Examination Special
.....Home Visits
.....Office Visits
.....Night Visits
.....Consultation
.....Obstetrical
.....Surgical Operation
.....Surgical Dressing
.....Microscopical Examination
.....Chemical Examination
.....Blood Examination
.....Urine Examination

TO JOHN C. SMITH, M. D., DR.
MARSHALL FIELD ANNEX
33 EAST WASHINGTON ST

RETAIN THIS PORTION OF BILL FOR YOUR RECORDS. NO RECEIPT WILL BE RETURNED ON MAIL REMITTANCES UNLESS REQUESTED AT TIME OF PAYMENT

FOR PATIENT'S RECORD
PAID BY
CHECK NO.
P. O. ORDER
EXPRESS ORDER
CASH
DATE

CHICAGO, _____ 191__

M _____

FOR PROFESSIONAL SERVICES

FROM _____ 19__ TO _____ 19__ $ _____

TO JOHN C. SMITH, M. D., DR.
MARSHALL FIELD ANNEX
33 EAST WASHINGTON ST.

DETACH THIS STUB AND ENCLOSE WITH MAIL REMITTANCE

MR. _____

$ _____

valuable time that can be conserved for other purposes. It would do away with the needless waste of time required to receipt bills, hunt up envelopes, addressing, sealing, stamping and mailing same, all of which is an unnecessary loss of time, energy and money, a needless duplication which can and should be avoided.

The illustration appearing in this article gives in considerable detail all the items needed for the information of any one caring to adopt such a system of needed economy.

CHICAGO MEDICAL SOCIETY SPECIAL TO A. M. A. CONVENTION.

The official route of the Chicago Medical Society special train to the A. M. A. Convention, at San Francisco, in June, will be over the Denver & Rio Grande, through the wonderful Royal Gorge to Salt Lake, and the Western Pacific, through the Feather River Canyon to San Francisco.

This route is by far the most scenic in the West, and a stop-over will be made at all important places, including Colorado Springs and Salt Lake, long enough to see the principal points of interest, such as Pike's Peak, Salt Air Beach, Mormon Temple, etc.

The special will leave Chicago on June 17, 1915, while the route from Chicago to Denver will be decided later, and each member will be so notified. It is not important which road we take to Denver, *but it is important,* at your earliest convenience, to signify your intention of going, in order that your rooms and other accommodations may be reserved.

Remember, San Francisco will be a crowded city this year, especially in June, and you can get no better accommodations than through the Chicago Medical Society.

Through the Gregory Tours, we are able to procure the best of everything and be relieved of all travel worry. This tour includes:

First-class railroad ticket to San Francisco and return.

Pullman standard sleeper to San Francisco and return.

Transfer of member and checked baggage to and from hotel in San Francisco.

Seven consecutive days at Hotel Plaza in San Francisco (two in double room), including breakfast.

Seven admissions to Panama-Pacific Exposition.

Admission to twenty attractions within the Exposition grounds.

Transportation to Los Angeles and San Diego and return.

The total expense of this tour, as outlined, will amount to $154.00 from Chicago. Each reservation should be accompanied by a deposit of $10.00 and $10.00 additional in thirty days. Do not put this matter off too long if you are expecting to take this trip.

Make all checks payable to Dr. R. R. Ferguson, 3923 N. Keeler avenue, Chicago.

Address all inquiries to the Gregory Tours, Lytton building, Chicago, where further information may be obtained. Telephone Wabash 5157.

THEIR STANDARD, "ACCURACY AND ETHICS."

A Physicians' Diagnostic Laboratory Association is being organized in Chicago and the surrounding territory, to give to the profession a laboratory with the highest standard possible, where "Accuracy and Ethics," will be the keynote; which will have a complete laboratory, equipped with every facility known to modern science a first-class X-ray equipment, where a clear cut negative is guaranteed or no charge; all under one roof, centrally located and under the supervision and direction of Dr. Franklin D. Smith and a corps of trained men, all graduates in their special analytical lines.

Dr. Smith was trained and schooled under Prof. F. G. Novy, of the University of Michigan, and was under Prof. Rowland E. Skeel, of St. Luke's Hospital, Cleveland, Ohio.

The association will, besides having the above facilities, give a series of lectures which will be of great benefit to the profession, copies of which will be mailed to the members, on the following and kindred subjects: The interpretation of various laboratory reports and X-ray negatives; the proper method of taking various specimens and the transmitting of same to the laboratory, etc., etc.

Members may also consult with members of the staff at any time and post themselves on any pathological, bacteriological, vaccines and other subjects.

It is the opinion of the members of the profession who are endorsing this association that a great benefit will be derived by all who become members.

TUBERCULOSIS NOTES.

The Chicago Municipal Tuberculosis Sanitarium is the first institution of its kind which has a department for the care of the tuberculous prospective mother.

In examining both apices do not forget that normally there is a difference between them both by percussion and auscultation, higher pitched percussion and breath sounds of bronchial character in right apex. If left apex equals it in percussion and auscultation, almost positive a lesion exists there.

Early apical lesions will be overlooked if deep percussion is used.

Besredka has reported (*Zeits. f. Immunitatsforschung,* Band 21, Heft 1-5, 1914) his work on complement fixation in tuberculosis. Results:

1. Reaction positive in first period.
2. Reaction positive in most cases of second period.
3. Reaction partially positive or negative in third period.

Considering the dangers of the Calmette eye test for tuberculosis, it is a test that should be abandoned.

Bates, *New York Medical Journal,* believes that eye strain is a predisposing cause of tuberculosis, and claims to have cured cases of tuberculosis by correcting error of refraction.

A NEW WELFARE JOURNAL.

In another column there will be found an article copied from "Child Betterment and Social Welfare," depicting the danger of arsenical poisoning in children from fly poisons.

This little journal is published, as its name would imply, for the benefit of the children. Its editor is Dr. G. Frank Lydston, and contributing editors are Dr. George F. Butler, Dr. Gordon G. Burdick, Rev. William N. Wycoff, Dr. Lee A. Stone, and Dr. Anson Cameron. It is published by the Child Betterment Bureau, 60 W. Washington St., Chicago, and those interested in child welfare would do well to subscribe for it.

We hope to see it regularly on our desk.

SWAT THE FLY POISON PERIL.

Of forty-seven cases of arsenical poisoning of children reported from fifteen states from July to October, 1914, in thirty-four the children were three years old or less. In thirty-seven the children had drunk poisoned water from a saucer containing fly paper. In eight cases the children were poisoned by sucking the wicks in tin receptacles containing arsenic, sugar and water. In two cases the children were poisoned by sucking a sponge used to moisten these wicks in poisonous fly destroyers.

The similarity of the symptoms of arsenical poisoning to those of cholera infantum make it quite certain that there are a great many more cases than are reported. Cholera infantum, one of the most common ailments of very young children, is prevalent at the time these poisonous fly killers are most used.

Most of the children are too young to tell the cause of their illness and unless seen taking the poison, arsenical poisoning may not be suspected.

Arsenical fly killers are commonly placed within the reach of young children. As sugar is used with the arsenic for the purpose of drawing the flies, the arsenical fly killers in whatever form are extremely dangerous to children. Many more deaths are caused by them than were caused by the phosphorus match, which practically has been abolished because of the fatalities to children. No deadly poison is so commonly put within the reach of children as is arsenic for killing flies.

As there are effective and safe methods of killing flies there is no excuse for using poisonous fly killers of any kind. The use in the home of poisons of any kind is dangerous, but all other poisons combined do not present the same dangers to children as do the poisonous fly killers. The little ones should be protected from this really grave and exceedingly common danger.—*From Child Betterment and Social Welfare.*

Correspondence

A DENIAL.

Chicago, Ill., Feb. 1, 1915.

To the Editor: In connection with a sensational report of an operation under the so-called "twilight sleep," there has appeared in various newspapers a statement purporting to be by myself which would imply, not only that I was present at the operation, but that I unequivoc-

ally endorsed the method. The following appeared in the New York World, Jan. 28, 1915:

"After this demonstration," Dr. G. Frank Lydston said, "twilight sleep for men will become common. The use of this anaesthetic will no longer be limited to childbirth cases, but women as well as men will benefit by it generally.

"This operation was important, and I am glad to express my professional opinion that it was completely successful."

I desire to state; first, that I was not present at the aforesaid operation; second, I never have been interviewed upon the subject nor, up to the present moment have I expressed for publication any opinion of the so-called "twilight sleep"; third, my present attitude toward the revival and sensational nomenclature of the employment of scopolamine-morphine hardly would comport with the sentiments expressed in the statement falsely attributed to me.

Very truly,
G. FRANK LYDSTON.

Public Health

FOR THE HEALTH OF THE COMMONWEALTH.

State Board of Health Asks for Men and Money to Suppress Preventable Diseases.

Illinois Now Spends Less Than One-Half Cent per Capita per Year for Health Protection.

The Illinois State Board of Health, awake to the necessity of devoting greatly increased attention to matters of public health and of bringing Illinois up to the level of other progressive states of the Union in this vitally important respect, is asking the legislature for an appropriation for the next two years amounting to $412,752, an increase of approximately 57 per cent over the amount appropriated for the biennium now closing.

Practically all of this increase is for development and enlargement of the service along lines of public health protection, no part of it for increased salaries, and very little of it is for the increasing work of medical registration.

Heretofore fully 80 per cent of the State Health Board's appropriations have been devoted to the work of medical registration and only 20 per cent to activities of a purely public health character. In the budget for 1915-1917 these proportions are reversed—80 per cent for health protection and 20 per cent for registration activities—due care being taken to avoid crippling of the registration service, in fact, increased efficiency in this division is provided for.

Along the lines of public health service development, the Board deems the following urgently required: A State Sanitary Engineer, an Epidemiologist, and eight District Health Officers, a Dairy Supervisor, and a Director of Publicity and Education. All of these and their necessary assistants are to be full-time employes.

The budget also contemplated the establishment of branch laboratories in the northern and southern extremities of the state for the purpose of facilitating diagnosis of diphtheria, typhoid fever and, possibly, tuberculosis, and it provides for the addition of anti-smallpox vaccine to the list of prophylactic agents which now are distributed free by the state.

The total appropriations for the State Board of Health at the present time for the dual work of medical registration and public health protection approximate $120,000 per annum. From this deduct the revenue derived from medical registration, about $30,000 per annum, which amount in its entirety goes into the State Treasury, and we have a net expenditure of $90,000. Therefore, Illinois, with a population of nearly six million people, appropriates for its State Health Department the niggardly sum of 1½ cents per capita, and of this amount less than ½ cent per capita is for health protection.

If "public health is purchasable," and it surely is, Illinois is buying mightily little of it. The continued prevalence of smallpox, scarlet fever, diphtheria, typhoid fever, and other preventable diseases throughout the state is in a very large measure attributable to this penurious policy.

The Illinois State Board of Health should be given all and more than it is asking for from the Forty-ninth General Assembly.

The health of the people stands far above all other considerations, it is an asset of paramount importance, it must be effectively safeguarded.

ILLINOIS STATE BOARD OF HEALTH REVISES CONTAGIOUS DISEASE RULES.

Stricter Quarantine Required Gives List of Diseases Which Now Are Reportable.

The State Board of Health has very recently formulated new rules for the control of communicable diseases which, when published and distributed, will be operative throughout the state of Illinois.

These rules set forth the diseases which are to be reported to local health authorities and by such authorities to the State Board of Health, by whom reports shall be made, quarantine requirements, placarding of infected premises, precautions which must be observed by physicians and attendants, handling of suspects, exposures and carriers, school exclusions, restrictions placed upon handlers of milk and other foodstuffs, disinfection and disposition of the dead.

Copies of these rules will be sent to every health officer in the state as soon as received from the printer. For information of the medical profession a synopsis of the rules will appear in the next issue of this Journal.

Under the new rules the following diseases are made reportable, the physician or other attendant, the parent or guardian, and the householder in the order named being held responsible for reporting same to their local health authorities.

Diseases now reportable in Illinois:

Actinomycosis
Anthrax
Chickenpox
*Cholera Asiatica
"Continued fever"—over 7 days
*Diphtheria (Membranous Croup)
Dysentery (a) Amebic (b) Bacillary
German Measles
Glanders
Hookworm Disease
Leprosy
Malaria
Measles
*Meningitis, Epidemic Cerebrospinal
Mumps
Ophthalmia Neonatorum
Paratyphoid Fever
*Plague, Bubonic
*Poliomyelitis, Acute Anterior (Infantile Paralysis)
Puerperal Septicemia
Pellagra
Rabies
Rocky Mountain Spotted-fever
*Scarlet Fever
Streptococcus (septic) Sor Throat
*Smallpox
Tetanus
Trachoma
Trichinosis
Tuberculosis (specifying organ affected)
*Typhoid Fever
*Typhus Fever
Whooping Cough
*Yellow Fever

Failure to comply with these rules is punishable by a fine of not exceeding $200 for each offense, or imprisonment in the county jail not to exceed six months, or both, in the discretion of the court.

*Diseases starred must be immediately reported to the State Board of Health. Other diseases are to be reported at close of each week.

DECATUR'S EXPERIENCE WITH SCARLET FEVER COSTLY.

Should Be a Lesson to Other Towns in Illinois.

On account of a rapidly developing epidemic of scarlet fever and the absence of a properly organized city health department to combat it, the city officials of Decatur, Ill., found it necessary to appeal to the State Board of Health for assistance.

Responding to the appeal, the state health authorities took charge of the situation on February 5, serving notice upon the officials and citizens of the rules and regulations to be strictly observed while the state officers were administering the health affairs of the town.

An early survey of the situation showed the presence of one hundred and twenty-seven known cases of scarlet fever in the town and pointed to the probability of a large number of roaming unrecognized cases as the probable cause of the spread of the disease. Quarantine in most instances was a farce and until the local medical society interested itself in the situation, little or nothing was done toward control.

With the coming of the state officials quarantine of the most rigid character was imposed, and following several arrests for violation of the rules, observance of quarantine has been remarkably good, notwithstanding the many hardships entailed.

Since the State Health Board assumed charge the weekly totals of new cases has been cut from 27, for the week ended February 5, to a total of 8, for the week ending February 27.

Decatur's experience, costing that community many thousands of dollars, should be a lesson to every other town in Illinois which is now practicing the false economy of getting along without an efficiently organized health department.

Needless to say, the one point upon which the business and professional men and the mothers of Decatur are now agreed and determined, is the immediate securing of a competent full-time medical health officer.

FOR THE PREVENTION OF BLINDNESS FROM OPHTHALMIA NEONATORUM.

Illinois State Board of Health Furnishes Prophylactic Agent Free.

Ophthalmia Neonatorum Now a Reportable Disease.

Silver nitrate in one per cent solution is now being distributed free by the Illinois State Board of Health with a view to encouraging its use much more generally in the eyes of newborn children, and thereby reducing the prevalence of ophthalmia neonatorum.

This prophylactic agent can now be obtained in most convenient form for use at any of the 350 free distributing stations (antitoxin agencies) of the State Board of Health, located throughout the state.

The Illinois silver nitrate ampule is the simplest, cheapest and probably the most efficient of any yet marketed. It was developed by the Lederle Laboratories of New York following suggestions offered by Dr. C. St. Clair Drake, Secretary of the Illinois State Board of Health.

In this connection attention is called to the fact that in Illinois ophthalmia neonatorum is now a reportable disease, reports of every known or suspected case being required to be made to local health authorities within twenty-four hours after discovery, failure to report being punishable by a fine not exceeding $200, or six months in the county jail, or both, in the discretion of the court.

STATE HEALTH BULLETIN TO RESUME ISSUE.

The State Board of Health will resume publication of its monthly bulletin, beginning with an issue in March.

Publication of a monthly bulletin was discontinued in 1913 and has not been resumed through lack of appropriation for this purpose.

The revived bulletin will in many particulars be a radical departure from the former style.

The mailing list, recently revised, contains some 12,500 subscribers. A few more can be accommodated. It will be sent gratis to residents of Illinois.

NEXT STATE BOARD EXAMINATION.

The next examination for candidates for medical license in Illinois will be held May 13, 14, 15, 1915, at the Coliseum Annex in Chicago.

Application for admission for the examination must be filed with the Secretary of the State Board of Health at Springfield, Ill., not later than May 1.

ILLINOIS STATE CIVIL SERVICE COMMISSION, NOTICE OF EXAMINATION, FOOD BACTERIOLOGIST, APRIL 3, 1915.

On April 3, 1915, an examination will be held at Anna, Carbondale, Chicago, Dunning, East St. Louis, Elgin, Jacksonville, Kankakee, Lincoln, Macomb, Mt. Vernon, Peoria, Pontiac, Springfield, Urbana and Watertown, to provide an eligible list for the position of Food Bacteriologist in the Chicago office of the State Food Commission.

The salary at present is fixed by law at $1800 a year. The limits recommended by the State Civil Service Commission are $150 to $175 a month.

The examination will be open to non-residents as well as residents of Illinois over 25 years of age.

The duties of the position involve making bacteriological examinations (and interpreting the results of such examinations) of milk, ice cream, eggs, meat, tomato products, etc., in accordance with the dairy, food and sanitary laws. The applicant should be able to state his opinions briefly and accurately as he may be called upon frequently as a court witness. Education equivalent to graduation in science from a college of recognized standing is required, as well as some knowledge of anatomy, histology and pathology and some training in animal experimentation. The statement is made from the State Food Commissioner's office that the person employed in this position will be given time to take work in the various medical schools or universities of Chicago so that he may acquaint himself with those subjects with which he is not thoroughly familiar.

In general the examination will be divided and the parts weighted as follows:

Training and Experience	4
Theoretical and Applied Bacteriology	6

This circular contains all the information to be given out. Application blanks may be secured by addressing the

STATE CIVIL SERVICE COMMISSION,
Springfield, Ill.

"The greatest influence on health is exerted by those things which we most freely and frequently require for our existnec, and this is especially true of water and air."—*Aristotle.*

THIS SPACE RESERVED FOR PERMANENT STATE MEETING ANNOUNCEMENTS.

To the Members of the Section of Eye, Ear, Nose and Throat:

As you know, the meeting of the Illinois State Medical Society is to be held May 18, 19, 20, at Springfield.

We are now getting up the program for the section. If you contemplate presenting a paper before that section, we should like to have you advise us of such action at once. Also please send us the subject of your paper at the same time.

We should like to urge upon you this year that interesting clinical cases be brought to the meeting by the members of the section. Also, that this year, as in the past, surgical clinics will be held at Springfield and the members of this section are asked to arrange for any such cases with the officers of the section.

We trust that you are going to make it a point to be with us, and we should like to know of your intentions at the earliest possible time.

Most cordially yours,

JOSEPH BECK, M. D., Secretary,
108 North State St., Chicago.

C. B. WELTON, M. D., President,
Peoria.

To the Members in General:

The Committee on Arrangements would like to announce that it is now prepared to make any and all reservations as requested. You are asked to give in detail the number in your party, whether you desire hotel or private family accommodations, the probable length of your stay, and to confidently expect an early reply to your communication.

The Committee wishes to correct the statement appearing in the last announcement to the effect that the University of Pennsylvania would hold a reunion at the coming State meeting. It should have read Jefferson Medical College, which institution is accustomed to getting its Alumni together regularly every year. If this statement spurs the "Penn' graduates to "do likewise" the desired effect will have been attained.

For several logical reasons the spacious Masonic Temple, in closer proximity to the Leland Hotel headquarters, has been obtained, in which to hold the sessions at the coming meeting, instead of at the Y. M. C. A. Building, as originally planned. This very desirable change will prove an added inducement to the attendance, as conditions are much more ideal. The four floors of the Temple will be given over to the Society and expedite matters materially. Lunch and dinner will be served in the basement to all who care to eat without leaving the building.

The Committee wishes to repeat the announcement that it will welcome any and all suggestions for the welfare of this meeting.

Address all communications to

H. C. BLANKMEYER, M. D., Chairman,
Springfield.

Auto Sparks and Kicks

CARE OF PUMPS.

Pumps operating with leather-faced pistons often are made more efficient by the use of neatsfoot oil. A few drops of this oil placed on the leather plunger will swell the leather and make it hold compression.—*Motor Age.*

RADIATOR WATER.

Soft water should be used in the cooling system and not hard water. Hard water contains more or less mineral matter, which will cause deposits in the radiator and water jackets. Especially is this true if the motor has a tendency to overheat and the water to boil.—*Exchange.*

LOCATING THE KNOCK.

A knock about a complicated piece of machinery is often a very elusive thing, and it becomes expensive hunting for it. Locate it as closely as possible by eliminating as many things as you can. If the knock persists with the clutch disengaged, you can feel pretty certain that it is in the engine. If you hear it only when the vehicle is running, it may not be the engine at all. You can load the engine by holding something against the flywheel as a brake. If convenient to disconnect parts, like the pump or the magneto, or the fan, and still test for the knock, this will avoid examination of these things for the possible cause of trouble. Notice whether or not the knock is present immediately after the engine starts or whether the engine must get hot first. If it occurs only when the engine is hot, it may be preignition. If by elimination you can cut out practically everything except the bare engine, you can remove the connecting rods and pistons, operating but one or two at a time, until you locate which one is making the trouble. It will probably not be possible to eliminate the cam shaft, and it is possible that the knock is around the cams or valve lifters, or in the teeth of the gears.—*Trade Journal.*

CAR GOES 28.7 MILES ON GALLON OF GASOLINE.

Judged by C. A. C. Committee.

Surprising results were obtained recently in Chicago, when in a distance test on the boulevards, a 1915 big six went 28.7 miles on a gallon of Red Crown gasoline. The test was made to demonstrate the fuel economy of high test gasoline, by the technical committee of the Chicago Automobile Club.

All through the trip the clutch was not slipped, except when traffic congestion made it necessary. The dash adjustment on the carburetor was disconnected, and in order that the test be a fair one, the fan was in operation throughout the run.

Next came the acceleration test. With the carburetor adjustment the same as during the economy run, the car was driven from standing start to thirty miles an hour in 12 4-5 seconds. The flexibility test saw the car run at four miles an hour, then speeded up to forty-four.

This test proves that the six is not an excessive fuel consumer, where the best gasoline is used.

OWNER LIABLE, THOUGH NOT IN CAR.

Another severe case, holding an automobile owner responsible for injuries when his car is driven by a third party, was recently decided in Massachusetts.

A motorist was entertaining two men and two women as guests at his summer cottage. The women asked for an automobile ride but the owner refused and (the words of the learned court) they then "kept teasing" him and did "quite a little coaxing" until finally he said: "Well, you can go if you want to, but do not be gone long," and took the key from his pocket with which to unlock the switch and threw it down. One of the men guests had a chauffeur's license and knew how to operate the car. He took the women out and, through carelessness, injured another person who sued the owner.

The owner testified that he did not want them to go, that he knew his guest would drive and thought they would go just a little way and come back, but denied that the guest was acting as his agent in taking the women out.

The court held, however, that although if the defendant had merely loaned his car, or permitted it for use, in which he had no interest, he would not be liable; still, as the women were his guests, and he told them to return, the relation of host and guest existed during the ride and it must be presumed that the driver had implied authority to act as the owner's agent, and the owner must therefore stand responsible for the injuries caused by him.—*Campbell* v. *Arnold,* 106 N. E. (*Massachusetts*), 599.

Society Proceedings

ALEXANDER COUNTY.

The Alexander County Medical Society met in regular session in the Commercial Clubrooms, Cairo, Ill., February 18, 1915. The president, Dr. G. H. McNemer, was in the chair and the following members were present: Drs. Dunn, Barrows, Grinstead, McManus, Fields, Gassoway, Dodds and Flint Bondurant. Dr. J. F. Leslie, who had recently moved to Cairo from Mounds, Ill., was a guest of the society. Under clinical cases Drs. Grinstead and Flint Bondurant reported cases of "Popliteal Aneurysm," and Dr. Gassoway reported case of "Gunshot Wound of Chest."

The paper of the evening was that of Dr. Barrows on "Infantile Convulsions." He gave a thorough and interesting discussion on this condition with which we so often come in contact.

Dr. McManus led the discussion, which was generally participated in by all the members, after which the society adjourned.

FLINT BONDURANT,
Secretary.

CHRISTIAN COUNTY.

The Christian County Medical Society met in the county court room at Taylorville Jan. 21, 1915, at 2 p. m., and was called to order by President Dr. D. K. Cornell and after the minutes were read and approved the following program was presented:

"Nitrous Oxide-Oxygen Anoci Association in the Practice of Surgery," Dr. Don W. Deal of Springfield.

"Perineal Injuries and Their Repair," Dr. R. C. Danford, Pana.

"The X-Ray in Medicine and Surgery," Dr. F. S. O'Hara, Springfield.

"The Law and the Doctor," Dr. J. H. Miller, Pana.

These were all splendid papers and the society was well repaid for their attendance.

The newly elected officers are: President, Dr. R. C. Danford, Pana; vice-president, Dr. George Tankersley, Owaneco; secretary-treasurer, Dr. S. B. Herdman, Taylorville; delegate, Dr. Walter Burgess, Pana; alternate, Dr. Jesse P. Simpson, Palmer; legal committee, Dr. D. F. Marton, Taylorville; Public Health Committee, Dr. T. A. Lawlor, Taylorville; censors, Drs. Armstrong, Nelms and Carroll, all of Taylorville.

The attendance was only fair, but there was no complaint and with the new staff of officers we will have the best of meetings in the future and keep up the standard of the association.

D. D. BARR, Secretary.

CLARK COUNTY.

Society met in regular session at Marshall, Ill., Feb. 11, 1915, at 2 p. m.

Members present: Johnson, Mitchell, Rowland, McCullough, S. W. Weir, Prewett, Pearce, Marlow and L. J. Weir.

R. A. Mitchell reported a case of typhoid fever in mild form beginning some twenty days after third dose of vaccine, which elicited quite a discussion.

Dr. J. C. R. Wettstein of Effingham read the paper of the meeting on "Tuberculosis," describing the germs, modes of infection and especially the early diagnosis and the importance of same, which require a systematic history of case and physical examination, tuberculin test, especially the skin reaction properly interpreted, as symptoms; Malaise, dry, hacking cough, fever, rapid pulse, etc., as signs, lagging of affected apex in respiration, spasm of trapezius and sterno-cleido-mastoid muscles. Early treatment means cure in 80 per cent of cases. Is slow and tedious and requires co-operation for a long time.

The paper was well received and a lengthy and interesting discussion was participated in by all present. The points were principally on treatment or rather the management of consumptive cases.

Dr. Wettstein conducted a clinic, presenting a woman with cough, rheumatism seven years ago for months, constipated, temperature 100 to 101 of evenings for some time past, lost some weight past six weeks. Many points made in the paper were demonstrated; right apex was affected.

Upon motion it was voted to instruct the president to appoint a program committee to prepare two or three provisional programs for next year and present same at next meeting.

Society adjourned.

L. J. WEIR, Secretary.

COOK COUNTY.
CHICAGO MEDICAL SOCIETY.

Clinical Congress for the Study of Local Spinal and Scopolamine-Morphine Anaesthesia

Bertha Van Hoosen, Chairman.

January 26, 8:15 P. M.

Subject—Spinal Anaesthesia.

1. Spinal Anaesthesia in General Surgery, W. Wayne Babcock, Philadelphia.
2. Spinal Anaesthesia in Gynæcology, H. J. Boldt, New York City.
3. Sacral Anaesthesia (extra dural injection of cocaine as used in Freiburg Frauen Clinic), Kurt T. Schloessingk, Freiburg, Germany.
4. Spinal Anaesthesia as Used in South America, Professor Debayle, University of Nicaragua.

Discussions, Arthur Dean Bevan, John B. Murphy, B. C. Corbus.

January 27, 8:15 P. M.

Subject—Local and Scopolamine-Morphine Anaesthesia in Obstetrics.

1. Cæsarian Section Under Local Anaesthesia, J. Clarence Webster.
2. Scopolamine-Morphine in Abnormal Obstetrics, John Osborn Polak, Brooklyn, N. Y.
3. Scopolamine-Narcophine Anaesthesia as Used

in Freiburg Frauen Clinic, Kurt E. Schloessingk, Freiburg, Germany.

4. A Psychological Study of "Twilight Sleep" by Means of the Giessen Methods, Miss Elizabeth Ross Shaw.

5. Scopolamine Amnesia in Labor, W. Francis Wakefield, San Francisco, Cal.

Discussions, J. B. DeLee, Henry F. Lewis, Charles S Bacon, Charles Paddock, Leslie Frankenthal.

January 28, 8:15 P. M.

Subject—Local and Scopolamine-Morphine Anaesthesia in Surgery and Gynæcology.

1. Scopolamine-Morphine Anaesthesia, M. G. Seelig, St. Louis, Mo.

2. Scopolamine-Morphine Anaesthesia in Abdominal Surgery, Emil Ries.

3. Local Anaesthesia in Thyroid Surgery, A. E. Hertzler, Kansas City, Mo.

4. Local Anaesthesia in General Surgery, M. L. Harris.

5. Local Anaesthesia and Its Use in Prostatectomy, Carroll W. Allen, New Orleans, La.

Discussions, Clifford U. Collins, Peoria, Ill.; Paul F Morf, Paul Oliver.

Joint Meeting Between the Chicago Medical Society and the North Shore Branch.
February 3, 1915.

1. Report of two cases of the Immediate Transplantation of Bone in Compound Comminuted Fractures of the Tibia and Fibula, the Broken Fragments being used for the Transplants. Exhibition of cases and lantern slides.

Discussion, Frank Byrnes, Jacob Frank, J. J. McGuinn.

2. Diagnosis and Treatment of the More Important Diseases that Frequently Involve the Mouth and Jaws.

Discussion, William H. G. Logan, Joseph Beck.

3. Some Ideas about the Treatment of Traumatic Joint Affections from a Masseur's Point of View.

Discussion, Hugo Ad. Oldenborg, John Ridlon.

Regular Meeting, February 10 1915.

1. The Complement Fixation Diagnosis of Rabies; Methods of Preparation of Reagents; Technique and Results, J. F. Biehn.

Discussion, F. P. Machler, C. A. Zell.

2. Wassermann Reaction in the Feeble Minded, H. J. Freemmel, Lincoln State School and Colony, Lincoln, Ill.

Discussion, W. T. Mefford.

3. The Case for Dementia Precox, Bayard Holmes, Sr.

Discussion, Meyer Solomon.

A Joint Meeting Between the Chicago Medical Society and the United States Live Stock Sanitary Association, February 17, 1915.

1. The Metabolism of the Tubercle Bacillus, Prof. Arthur I. Kendall, Department of Bacteriology, Northwestern University Medical School.

2. Cancer of the Breast (Lantern Slides), Dr. W. L. Rodman, President-Elect American Medical Association.

3. The Spread of Disease Through Garbage, Dr. V. A. Moore, Cornell University, Ithaca, N. Y.

4. Insects as Carriers of Disease, Prof. D. K. McMillan, Assistant State Entomologist, University of Illinois.

5. Trichinosis, Dr. B. H. Ransom, Zoologist, Bureau of Animal Industry, Washington, D. C.

Regular Meeting, February 24, 1915.

1. The Pre-Institutional Care of the Insane, C. C. Ellis, Chicago State Hospital.

Discussion, C. B. King.

2. The Intra-Nasal Opening of the Frontal Sinus for Chronic Suppuration, Otto T. Freer.

Discussion, J. Gordon Wilson.

3. The Harrison Anti-Narcotic Bill; What Physicians Must Do to Conform to the Act, Julius F. Smietanka, Collector of Internal Revenue, Chicago.

Discussion, Alfred S. Burdick, Charles Truax.

ENGLEWOOD BRANCH, C. M. S.

The Fourteenth Annual Banquet and Ladies' Night.

The fourteenth annual banquet and ladies' night was held on the evening of January 20, 1915, at the Midway Gardens. The event goes down in the history of the branch as a brilliant success.

Time nor space permit of a detailed account and suffice it to say that everybody had an enjoyable time and appeared perfectly satisfied with the grand work done by the banquet committee, of which Dr. J. A. Waska is chairman.

The menu was very good and served in excellent style. The entertainment was unique and, we believe, thoroughly enjoyed and appreciated. There was something doing all the time and there was not a dull moment. Money was not spared and the professional entertainers were the best that could be obtained, each an artist in his or her line.

Dolly Randolph's Orchestra Comique, composed of members of the Englewood Branch, was a grand success and the hit of the evening. The hat rack trombone solo by Dr. Webber, the garden hose and water spout duet—"tuba and saxaphone"—by Drs. Myers and Lovewell, and the clothes rack harp solo by Dr. Mundt were the stellar performances of great musical stars and were loudly applauded. Dr. Waska, as high chief mechanician, was a great success and the orchestra, under the capable leadership of Miss Randolph, covered itself with glory. Those who missed this event missed a rare treat and those who came enjoyed themselves immensely and felt amply repaid for coming.

We owe a vote of thanks to the banquet committee. There were over two hundred present.

ARTHUR G. BOSLER, Secretary.

Regular Meeting, February 2, 1915.

This meeting was held at the Englewood Hospital. President Dr. Joseph Sherlaw presided and the following program was presented:

1. "Relaxation of Muscles in the Treatment of Fractures," A. J. Graham.

2. "Treatment of Fractures by the Use of Plates and Other Materials," F. A. Lofton.

Both of these papers were well written, very instructive and interesting.

Immediately preceding the papers Dr. O. F. Scott showed a case of bone regeneration following a gunshot wound of the lower third of the leg. X-ray plates taken shortly after the injury and others taken one year later were exhibited. The patient has a very useful limb.

The discussion was opened by Dr. Paul B. Magnuson, who stated that he believed that too much hardware was being used in bone operations. He then recited his experiments on animals and also gave his experience in fifty cases. He uses ivory screws and plates. For oblique fractures he uses ivory screws. These screws are the same size as the hole drilled in the bone, and being the same size cause no irritation. Where a screw of larger size than hole is used an irritation is set up and this, Magnuson believes, leads to infection. He handles the bone with his gloved hand and fingers and has had no trouble with infections. In transverse fractures he uses ivory plates. These plates are short, being from 1½ to 1¾ inches long, and cause very little traumatism. With a specially devised clamp the bones are held in position. With two parallel circular saws, set at the exact width of the plate, a slit is cut in the bones. Into this the ivory plate is placed and is held in position by an ivory peg. By this method the bones are firmly held in position. In the case of the femur the entire limb can be raised by the heel. The patient is put to bed and nothing is used save a few sand bags. Magnuson, however, believes it wise to give the limb extra support by the use of external splints. The ivory is absorbed. Magnuson concludes the whole is a matter of applying correct mechanical principles and that animal materials should be used.

The discussion then became general and quite animated. Half an hour after the meeting closed there were still a dozen or more discussing.

The night being a good one to stay at home, our attendance suffered considerably, there being only 49 present. ARTHUR G. BOSLER, Secretary.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting Held October 29, 1914.

The president, Dr. Otto J. Stein, in the chair.

Case of operation for carcinoma localized within the larynx.

Dr. Otto J. Stein presented a patient, a man, who was operated on about two weeks ago for a carcinoma, well localized on the right vocal cord, occupying the right anterior half, the anterior commissure, and a small portion of the left vocal chord; also slightly subglottically. This case was diagnosed by the usual method of taking out a piece of the endolaryngeal route, and followed in a couple of weeks by the laryngo-fissure. There was nothing unusual about the operation. However, there were a couple of points he wished to call attention to. First, he thinks that wherever it is possible to operate under a local anesthetic it is advisable to do so. He used the combined method in this case, as he has previously in a few cases similar to this one, by using ether for the introduction of the tracheotomy tube, and then immediately following with the rest of the operation by local anesthesia. In this case he resorted to a method never before used in operating by himself, namely, anesthetizing the larynx by injecting both the superior laryngeal nerves. This gave perfect anesthesia, so that he could work with absolutely no reflexes whatsoever during the entire operation, with the patient awake.

He also did another thing, which he had never done before, and which he thinks of advantage, namely, using an unusually high incision, away up to the hyoid bone, in this way avoiding the severing of the cricoid. That evidently has an advantage in the process of healing. It gave him all the access he wanted to the interior of the larynx, plenty of room without any trouble, and it also gave a support afterwards which seems to have hastened healing remarkably. This patient has progressed so remarkably that one would hardly know any such operation had been performed. He has had no disturbances in any way. He is getting some voice back. There is a fibrous band forming, where the right cord was taken out, back to the vocal process, and over the anterior quarter of the left vocal cord.

Dr. Charles M. Robertson asked Dr. Stein what condition was present in the commissure?

Dr. Stein replied that there were granulations there. It was too early for any recurrence.

DISCUSSION.

Dr. J. R. Fletcher had seen the operation and was delighted with the manner in which Dr. Stein had conducted the anesthesia. The patient made no manifestation of any consciousness of pain during the entire operation. He was conscious and lay there as quietly and serenely as though nothing were being done. There was almost no hemorrhage, and one could see the field of operation very well.

Dr. J. Gordon Wilson asked Dr. Stein what he injected.

Dr. Stein replied that he had asked for a one-half per cent. novocaine solution, but was told afterwards that he had been given and had used a one per cent. novocaine solution.

Dr. G. P. Marquis asked if there was any hemorrhage following the operation, to which Dr. Stein replied that there was a little.

Dr. Joseph C. Beck has had some experience with the method of injecting the superior laryngeal in operations upon not alone laryngo-fissure, but also the operation of laryngostomy in a healed-out syphilitic case, in which he did the complete operation of severing the larynx, removal of the tissues within the scar tissue, and the introduction of up and down tube, with absolutely no cough or reflex, whereas in other manipulations on this patient, thoroughly cocainizing the interior of the larynx, it had been practically impossible to do anything for him at all. He was very irritable. That

method of anesthesia in larynx operations, he believes, is coming more and more into vogue, even in major operations, as laryngectomy. The combined anesthetic, however, he would call the injection of this blocking method, plus the general anesthesia, which has not the purpose only of making the patient insenitive, but further preventing the shock following the operation. He believes it is not only in the larynx that we should think about the nerve blocking, but also in operations on the nose and elsewhere in the region of operation. In other words, coming to the principle of Crile, of anoci-association. The book recently published by Crile on that subject is most interesting and very valuable to men working in the department of laryngology.

In regard to the question of this procedure for carcinoma, he felt that question should be discussed, namely, as to the value of laryngo-fissure in carcinoma, as a cure for the disease.

He believes that when the diagnosis is made of a carcinoma within the larynx, the surgeon should be prepared to remove the larynx, because the splitting of it and the laryngo-fissure produce probably implantation and secondary carcinoma outside. We know that Semon, St. Clair Thompson, Ballenger, and others, have had wonderful successes with laryngo-fissure. The speaker has seen a few of these, and has also done a few. However, recurrence is very common in his practice of it.

Dr. William L. Ballenger has also had some experience with this method of anesthesia. He had been in Crile's clinic, together with some of the other members of this society, and had seen him do his preliminary operation in total removal of the larynx. He does it under the blocking method. Since then the speaker has tried it a few times in laryngo-fissure and total removal of the larynx, and found it perfectly satisfactory, as it was in Dr. Stein's case. As to whether the operation for carcinoma of the larynx is successful or not, he has four cases living on whom he operated, one two years ago, and a few months ago this man was perfectly well. When he was in Seattle three years ago last September, he operated on a case, doing the operation of laryngo-fissure. This patiest, a year ago, was reported as being perfectly well. Four years ago he performed a total removal of the larynx—not, however, using this method of anesthesia, but by general anesthesia. This patient is perfectly well. There was also another patient down the state on whom he operated three years ago. This patient is still living and apparently cured. So the question comes up, whether or not these operations are successful. The speaker is of the opinion that they are successful. A relatively good per cent. of his patients are still living, three or more years ofter operation.

Dr. Charles M. Robertson has certain rules that he lays down in operating on cases of this type, which are about as follows: There are four or six types of cases which we are called to treat. If the growth is absolutely intrinsic and does not affect the perichondrium, a laryngeal fissure is indicated. If the perichondrium is affected, the case calls for complete laryngectomy. If the glands outside of the larynx are affected, there is no use operating at all; the disease has already gone too far. The only thing to do in a case like this, unless we wish to experiment and see how long the case will last by operative interference, is to do a tracheotomy and let the patient be as comfortable as possible so long as he lives.

One carcinoma is different from another carcinoma, although the microscope may show the same findings in both cases. There is a lessened resistance that we have to take into consideration. Even that is questionable, because one case that will look as though the resistance is absolutely at par will go like wildfire; another case, in which the resistance looks *nil* will last for an indefinite period of time. While in London this summer he saw a case of cancer of the top of the larynx, n which the upper part of the larynx, the epiglottis and tonsil were involved. While in the hospital this man was taken with erysipelas, and when he recovered the cancer was well. The speaker saw him after two years, and the throat looked normal. He also saw a case of sarcoma which was cured in a similar way. That would bring up the question of injecting these cases with the streptococcus serum, but so far as he has been able to learn this has not been very successful.

Dr. Beck asked Dr. Robertson if he meant Coley's serum.

Dr. Robertson replied that he did not mean Coley's serum; he meant simply a streptococcus serum. He does not think Coley's serum is good. He has not seen anyone who has any faith in it except Coley.

The matter of operating on these patients under general anesthesia would, in his opinion, be very greatly assisted by the blocking off of the superior laryngeal, because the reflex in the larynx is intense, and cocaine will hardly do even in the cases that are not very sensitive. In years gone by he has seen suggestion do away with reflex in the larynx, and that, with cocaine, will sometimes do very well. You can relieve the reflex by suggestion, but you cannot relieve it with cocaine.

He has several cases in town where he had done laryngeal fissure, and he is very much inclined to be in favor of laryngeal fissure, even as a preliminary step to complete laryngectomy, because in looking at the larynx from above you get a perspective, and cannot tell the extent of the growth. It may extend down the larynx to a considerable extent beyond the cord. It also is very prone to affect the esophageal wall, and where this is the case, his experience, and the reading he has done, would indicate that these cases are alraedy beyond the scope of the surgeon. Where the epiglottis and the base of the tongue are already affected, the case is absolutely hopeless.

Regarding operation on these cases: In the type of case reported, for instance, Dr. Robertson always likes to follow the enucleation by the use of the actual cautery. He burns them with the Paquelin right to the cartilage. You might think there would be quite a lot of reaction from that type of treatment, but there is not. When he first commenced that method, he put in a tracheotomy tube for fear the patient would develop an edema of the epiglottis, but has never seen this occur. He, therefore, discontinued the use of the trachea tube.

Dr. Robertson has not had the wonderful experience that Dr. Ballenger said he has had. He has had cases live eighteen months, but that is the longest, after a total laryngectomy. The late stage of the cases may determine the longevity to a marked degree, as they are usually too far advanced at time of operation to promise good end results. His last case died of cerebral embolus the second day. He thought it was a very favorable case, and had expected to see the man get well. The more he sees of cancer—and he has seen considerable of it—the more helpless he thinks we are. Cancer, in his opinion, is a disease that is broader than the tumor. It is a disease that is absolutely in charge of the entire system before the stimulation of the cell commences, and when we operate on a cancer of the throat that is absolutely intrinsic, we may have resistance enough to overcome the condition of the blood, so that the disease will be alleviated or arrested, but it seems to him that when tissues commence to be stimulated and piled up the case is already beyond hope.

Dr. William L. Ballenger said Dr. Robertson had very well outlined the hopelessness of these cases, but he wished to repeat what Dr. Crile told him. A patient called on him, and on examination he found involvement of the tongue, pharynx, larynx, glands—a very extensive involvement—and he, of course, believed the case hopeless. The patient would not hear of this, however, and insisted on operation. The operation was performed, consisting of removal of the tongue, the lateral and other walls of the pharynx, tonsils, glands and larynx, and Dr. Crile said the patient has been well several years. So, then, there are occasionally desperate cases that recover.

Dr. Robertson said that he did not mean that he has no hope at all in these cases, but it looks that way to him.

REPORT OF A BACILLUS RARELY FOUND IN THE TONSIL.

Dr. J. Gordon Wilson wished to record the finding in the palatine tonsil of the bacillus aerogenes capsu-

latus (Welch). The tonsil was removed for frequent attacks of tonsilitis in a patient who had had frequent severe attacks of gastro-intestinal disturbance and slight chronic articular rheumatism. The full report, he will present at a future meeting of the society. The rarity of its reported occurrence in the tonsil (this is only the second case), and its frequency in the gastro-intestinal canal, together with the marked symptoms which it is reported to occasion, justify its presence being noted.

PAPER: THE OPERATION OF CHOICE IN MAXILLARY SINUS DISEASES.

Dr. George Paull Marquis wished to point out a few of the advantages and at the same time mention the only disadvantages he knows of connected with the operation devised by Denker. In the author's opinion the question of greatest importance to be decided in the choice of a particular operation is: Which operation will give the patient the greatest probability of a cure? Which can only be answered after weighing the following points: (1) Which method will permit him to do the most thorough work? (2) By which method can he gain access to each and every part, depression and bay in the maxillary sinus? (3) By which method can he not only gain access to, but also inspect each of these parts? (4) Having cleaned out the sinus, which method is followed by the most rapid healing? (5) Following which method are the parts more nearly in their normal relation and the antrum least liable to reinfection in the future? (6) Will the operation in question be followed by unpleasant or even serious symptoms, such as localized areas of anesthesia or severing the nerves, occlusion of the naso-lachrymal canal, facial deformity, fistula into the mouth, etc.?

Dr. Marquis described the operations of Krause, Hajek, Menzel and others, Luc-Caldwell, Kuster Desault, Boenningshaus, Friedrich, Kretschmann, Canfield and Denker, narrowing his discussion down to a comparison of the relative advantages of the Luc-Caldwell and Denker operations. As to the ease with which these methods can be employed it is naturally one of opinion, but in his experience and after watching a number of others perform both operations, the Luc-Caldwell is more difficult than the Denker. Concerning the second point of comparison, that of relative degree of normality of the structures and probability of reinfection, the Denker far surpasses the Luc-Caldwell. In the latter the chief point of advantage, as put forth by its supporters, is the large opening into the sinus from the nose and the easy access after resection of a portion of the inferior turbinal, but this very act weighs against the operation, for the structures are certainly less normal with the part of the turbinal removed, and there is greater liability to reinfection with the protecting turbinal gone. Maintaining the turbinates intact is one of the strong points in favor of the Denker method.

With regard to rapidity of healing the precedence is given to the Denker operation. In a series of Denker operations the longest time he has seen until complete healing had taken place was thirty-three days and the usual time has been about three weeks. This can be explained by the fact that the cavity is open to more thorough inspection in the Denker operation and also the covering of the floor with the membranous wall of the nose, as practiced by Denker, reduced the time necessary for healing by a decided margin.

As to sequelæ, there may be some slight advantage in the Luc-Caldwell, if any conversation with operators is borne out. He has found in the Denker that the nerve supply to the front teeth as far as the bicuspid is interfered with.

Skillern has recently come forward with a very effective and simple operation, which has in its favor (1) It is easily performed and can be done under local as well as general anesthesia. (2) It gives a good field of observation—better than the other intranasal operations, with the exception of the Canfield. For cases of empyema without polyp formation or bone necrosis it should afford as good a result as the Denker or any other operation and is certainly more easily performed.

To sum up: The Denker under each one of the standards of comparison is superior to all the others, except the Canfield. The only disadvantage that can be brought against it is the loss of sensation in the three front teeth. How permanent this is he is not able to state, as all but four of his cases have been lost sight of. These four have been operated on within the last year and still have the numbness referred to.

DISCUSSION.

Dr. William L. Ballenger has had considerable experience with the Denker operation, as performed by Hajek at least, and also with the Canfield operation, with some modifications—probably an equal experience with each, and he must confess that the Denker operation, performed through the mouth, is superior to the Canfield procedure, in his experience. The Denker operation, as performed by Hajek, which is his model, is a work of perfection. He has never seen Denker do any work. He saw Hajek operate on three or four cases three years ago, and with Hajek's lip retractors the field is absolutely open to inspection during the operation. It is just as though the antrum were taken outside of the face and inspected with perfect liberty. That, of course, is the great advantage of this operation. In the Canfield operation, while you can see the interior of the antrum remarkably well, it by no means compares with the view obtained by the Denker operation through the mouth.

With regard to the time of healing: He has never performed the typical Denker operation, using the nasal mucous membrane as a flap. He does not believe there is any advantage in it, because his cases certainly get well as quickly as those mentioned by Dr. Marquis, which were operated on with the flap. Neither does he pack the antrum after operation—not even immediately following the operation. He does occasionally put in a very small wick for drainage, but not always, in either the Canfield or Denker operation. He does not believe there is any advantage in packing, but a great disadvantage. There is always the possibility of retention of secretions and subsequent reinfection.

He has not recently resorted to the mucous membrane flap in any of his sinus operations, and does not feel that his results justify him in attempting it now.

The point he wished to emphasize was that if the Hajek

lip retractors are used, a remarkable view of the field will be obtained. In his opinion, the Denker operation without the flap, and, if desired, with it, is the operation of choice in chronic empyema of the antrum of Highmore. He does not believe, however, that it is best to remove the contents of the sinus in all cases—perhaps in none. He believes with Dr. Myles, of New York, that the antrum is too large a cavity to ever completely fill with granulation tissue. If you do a complete denudation of the sinus, it only partially fills, and there will be a suppurating surface left. He did not know if Dr. Marquis implied that there should be a complete denudation. Of course, the obviously diseased tissue should be removed. But one should always be careful to leave some periosteum in these cases, because we cannot hope to get complete filling in of so large a cavity by granulations, and in that case there is liable to be more or less discharge from that cavity for all time to come.

Dr. Joseph C. Beck, in view of what Dr. Ballenger said, namely, that he believes with Dr. Myles that the antrum cannot be obliterated, said that he thinks it can and does become obliterated, and that it is necessary in some cases to resort to that method of treatment when the intranasal method or the Denker operation is performed, and does not cure the case. It is not his fortune to cure these cases in three weeks. In the majority of them he finds that they suppurate for some time, and many of them do not get well unless he attempts to obliterate the cavity. The statements made about chronic suppuration were too broad, without mentioning something of the pathological conditions present in the antrum. If it is a simple infection, no necrosis having taken place, then any simpler method of treatment will suffice. But where necrosis and true granulations exist, such cases will continue to suppurate until that bone is healed. It is no different there than in the mastoir or any other cavity lined by mucous membrane and exposed to the external world. Therefore he believes there are certain cases that the Denker opration, nor any other less radical operation, will not cure. He has had two cases in which he exposed the cavity obliterant on account of a neuritis secondary to the operation of obliteration, in which he found the cavity had entirely closed, the opening into the inferior meatus being only a small dimple. In the second case he did not operate, but inspected through the opening with the pharyngoscope, and it had filled up with granulations. In such cases it is necessary to remove a greater portion of the bone, in order to make the cavity, so to speak, collapse. You must go underneath the malar bone and remove the bony structure. In these operations he employs the electric bur, drilling all through the cavity, and shaving off the bony surface almost to the outside periosteum of the antrum, orbital as well as any other place. He realized the inconvenience from a secondary neuritis or neuroma of the inferior orbital nerve, but he has not seen any great difficulty with that, and it is easy enough to control, if there is any secondary pain, by injections of alcohol into the inferior orbital foramen.

Dr. Charles M. Robertson said that the mucous membrane and the perichondrial layer on the nasal side make a very thick flap, and it is a flap thick enough so that you can mould it to suit yourself. That is rather a difficult thing to do, and requires a good deal of care, but if one is careful in putting the packing in (the speaker always dresses his cases) to get the flaps in place, they will stick.

Dr. Beck had raised a very good point regarding the pathological condition that is present. In cases of infections of the mucous membrane, Dr. Robertson does not pretend to take out the mucous membrane of the antrum any more than any other place in the nose. If there are polypoid degenerations, the polypoid degeneration is removed. He does not know just whose operation he performs, but he thinks it is the Caldwell-Luc rather than the Denker, although he does not follow either one, but a combination of both. However, he is particular about cutting away the antrum wall, destroying the anterior angle. The neuralgia, or lack of function of the superior dental nerve of which Dr. Marquis spoke, occurs because he gets too close to the floor of the antrum and injures the superior dental in the bony canal. The superior dental nerve is very often slow in recovery, and very slight massage with a curet will sometimes injure it enough to disturb the function for some time. The lip neuralgia and lack of sensation are probably due to the stretching of the skin of the cheek during the operation, and will disappear after two or three months.

As regards destroying the antrum by the method Dr. Beck spoke of, one must be careful in any cavity in allowing granulations to go on. We see that very often in the mastoid, where granulations are allowed to become rampant. The granulations adhere to each other and form suppurative cavities. If anybody were to operate on any cavity in his body he would require him to superintend the granulation, allowing it to progress gradually rather than to go as it pleased. As a matter of fact, Dr. Beck said that the cavity was absolutely destroyed, and that there was only a dimple of an opening in the nasal wall. This shows that the antrum, if the mucous membrane is denuded, will close, and that is one reason why Dr. Robertson is particular about folding flaps into the antrum, so that he knows the opening will stay there forever. The Denker operation, in throwing the flap down on the floor of the nose, will allow an opening, but not as you leave it at the end of the operation. By the speaker's method the opening stays where he leaves it, because he has measured these openings five and six years after operation, and they are just where they were when the operation was completed. The matter of taking away bone would be the only way in which you could destroy a cavity like this; get the bone so that granulations come from bone tissue. When Dr. Brophy read a paper before this Society last spring it was stated that cavities in which the mucous membrane was removed healed over by epithelial tissue, and that epithelial tissue was prone to be very easily infected, because of lack of vitality. That is one reason why Dr. Robertson likes to leave mucous membrane in the antrum, which will close over the periosteum and meet the mucous membrane flaps that generate from the mouth of the opening, as he expects to leave them. It seems to him that the Denker operation, or the Caldwell-Luc-Denker, if you call it so, is the only operation, and it seems to him that in all of these cases, unless you just scratch out the antrum a little and leave all of the mucous membrane in place, they must necessarily be packed. If you just curet a little of the mucous membrane there is not any particular idea in packing the nose, although, to him, it is absolutely essential that he put in dressing. He has never seen any after effects from infection by reason of retained secretions. That is a reflection on the man who puts the packing in the nose. He drains rather than packs, and there is a great difference in the way dressings are placed in the cavity. He would expect his cases to go on and suppurate if he put a drainage wick in a cavity. He does not do it in the mastoid, and does not expect to put it in the antrum, although Dr. Ballenger has probably just as good results as he, and he practices that. He leaves the dressings in for four or five days, and that is the last he treats them, and they get well. The patient washes his own nose out. If these patients are not well in two or three weeks, he thinks there is something wrong in the technic. He would not say that these were the cases referred to by Dr. Beck—disease of the bone—but they are the cases Dr. Marquis spoke of, of infection of the mucous membrane; in other words, chronic cases.

Dr. Norval H. Pierce confessed to a sense of uncertainty as to the outcome of any given operation for empyema of the maxillary sinus, because he has had most extraordinary results from simple opening through the inferior meatus in cases that he believed were very severe, and he has had failures from the Caldwell-Luc or the Denker operations. Being somewhat at sea in this matter, he thought he would become experimental in a case on which he operated toward the end of last winter. It was a severe case with profuse purulent discharge from the nose, in a girl in the early twenties. He took away the anterior wall and found the antrum entirely filled with polypoid tissue, so that he removed the entire mucosa of the antrum, and found sharp ridges of bone running about this cavity, so that it was divided into various little pockets. With a bur he took away all these ridges, so that at

length he had a denuded bony cavity, with a smooth surface. He did not open into the nose. He did not even enlarge the normal opening into the nose. He found with a probe that it was quite large. He did not pack the cavity. He sewed up the buccal incision over the bony wound, and the patient had scarcely any discharge from that antrum from the time of operation until he saw her last, perhaps six months afterwards. Dr. Andrews will probably say that that was a blood clot healing. There is no doubt but what that cavity did fill with a blood clot.

Dr. Corwin asked Dr. Pierce if transillumination was done and what it showed?

Dr. Pierce said there was always a shadow, both before and after operation, on that side.

He has had failures with every kind of operation. The majority of these cases get well; there is no doubt about that. But the very cases you think are going to get well are the cases that do not get well. He has at the present time under his care a physician of prominence, and in this case he was very careful to do a thorough Caldwell-Luc operation, except that the nasal opening was in the middle meatus. He took away the diseased portion of the membrane and left little islands, which he thought on inspection were healthy mucosa. He did it under a local anesthetic. Everything went beautifully, but now, after a year, muco-pus is still coming from that man's antrum.

Dr. Beck brought out a very good point. The outcome depends largely on the pathological condition of the maxillary antrum. If there is granulation tissue, there is also necrosis—superficial caries of the bone—and this should be carefully removed with either a bur or a curet. Personally he believes that it is essential to be able to inspect the entire antral surface in these cases that resist the ordinary non-radical procedures. This is the essential in all radical operations. He does not believe the Caldwell-Luc, or the Denker, or any other operation, will invariably cure an empyema of the maxillary sinus. A statement such as that is rather too sweeping.

Dr. J. Holinger, in the early part of the past summer, operated on three antra according to Profess or Denker's method and since July five more. Before the beginning of last summer a number of cases had been operated upon and had been under control ever since. He had had the good fortune to assist Professor Denker in an operation in Boston and does not deviate at all from the operation as he saw it at that time.

Regarding the pathology of the suppuration of the antrum: He considers it the advantage of the Denker operation that the whole cavity can be controlled; the pathology—whatever it is—can be seen and felt. The great variety of findings in the different cases has already been mentioned. Ridges and even bony septa which close out parts of the antrum are seen and removed. Necrosis of bone can be seen. Polypoid and even malignant degeneration of the lining may be recognized and properly dealt with.

As to the removal of the membrane by means of the curet, he has more than ever the impression that it is better to have even a polypoid, degenerated membrane than no membrane at all. He does not, and Denker does not, remove any of the lining of the antrum except from the floor, where the flap of the nose will cover the defect. The results, as he has seen them, have been universally good. Amongst the patients he operated on in August there was one who had had the other side operated on by a member of this society by another method. Six weeks after the Denker operation he washed both cavities. The cavity that was operated on by the other method still contained pus. The cavity operated on by the Denker operation was absolutely clean and did not contain any pus at all.

However, he had to confess to one failure, but that was satisfactorily explained. It was a very old syphilitic case, who did not have—as was shown afterwards—a suppuration of the antrum of Highmore alone, but of both antra of the ethmoidal and frontal sinus; that is, a pansinuitis. The other sinuses did not cause any clear symptoms and became evident only after the operation. An x-ray picture showed the frontal sinuses absolutely normal and later on the speaker could wash out a lot of pus from them. He wished to remind the members that syphilitic suppurations of these parts do not yield to iodide of potash and mercury, not even to salvarsan. Dr. Louis Schmidt cautioned him not to use a strong anti-syphilitic treatment in these cases, at which Dr. Holinger was surprised, but Dr. Schmidt insisted that such treatment often makes the suppuration worse and such was the case. In this case all the cavities have been washed out every day—the antra, frontal and ethmoidal sinuses—which is a very tedious work, and the patient has improved remarkably in a comparatively short time. That is, he has improved more in two weeks than during the two months previous.

Denker always emphasizes the point of smoothing away from the floor the last remnant of the wall between the antrum and the nose; no ridge must be left, so that there is a perfectly smooth floor from the nose into the antrum. If there are difficulties in the after-treatment you will sometimes find that this point has been overlooked.

Dr. George E. Shambaugh said that when this subject of the operations for the relief of chronic maxillary sinus empyema was discussed last year he had called attention to the favorable results which he had seen in a number of chronic cases where the opening had been made through the middle meatus. In listening to Dr. Marquis' paper he had not noticed that any mention was made of this method of curing chronic empyema of the maxillary sinus. The speaker believes that an operation through the middle meatus could be more properly considered the operation of choice for the relief of empyema of the maxillary sinus than the radical Denker procedure, which should be reserved only for cases where the simpler operation fails to give satisfactory results. He has already had quite a series of these cases and has been not a little surprised at the favorable results obtained. He does not believe that it is possible to tell positively before going into the maxillary sinus just what conditions will be found when the sinus is opened up.

The operation is performed by taking off the anterior part of the middle turbinated body and then breaking through the nasal fontanelle into the maxillary sinus, and with suitable forceps, making a large opening, one-half to three-fourths inch in diameter. The whole operation can be performed in a very few seconds under cocaine. It seems that allowing the air to enter freely into the maxillary sinus is sufficient in itself to bring about a cure in many cases. In some cases where the discharge is persistent it is possible for the patient to irrigate the sinus very successfully at home by the use of an ordinary Eutachian catheter. The patient should be taught by tipping the head forward how to empty the sinus of all fluid after irrigation. The writer does not believe that the presence of polypoid degeneration of the mucous membrane of the antrum renders the case unsuitable for this method of treatment. There can be no doubt that extensive changes in the mucous membrane of the antrum return to a normal condition after allowing free ventilation through an opening in the middle meatus.

There is no objection to this method of operating that some of these cases do not get well with this simpler procedure. Where a case still continues to have enough annoyance after this operation to warrant a more radical procedure, then one may go ahead with the Denker operation. Since the speaker has had the opportunity of seeing Professor Denker do his operation he has been convinced that this is the best method for the relief of otherwise intractable empyema of the maxillary sinus.

Dr. A. H. Andrews was pleased to hear Dr. Ballenger say that he did not make the flap in breaking down the wall between the nose and sinus and also to hear him say that he did not pack these cavities. If he had said that he did not wash them out afterwards he would have been still more pleased.

Dr. Ballenger said he had intended to say that, because he does not wash them out afterwards.

Dr. Andrews was also pleased with Dr. Shambaugh's position. Personally he does not know of any way to tell before operating just what the conditions are in the antrum of

Highmore. He does not know of any way to tell whether it is a chronic or subacute case. The history usually is not clear. The patient himself does not know when the trouble began, how long it has existed or anything about it. They frequently do not know they have any trouble until examination for some obscure nasal trouble discloses pus in the antrum. He has followed the plan mentioned by Dr. Shambaugh almost invariably, unless the patient has come from a distance and must have something done that offers the best chance of ultimate recovery and must have it done at once. He always goes in through the middle meatus, makes a considerable opening, cleanses the cavity with a current of compressed air and sees how the condition gets along. Anyone who has not used that method will be surprised at the number of cases that will require no further operative treatment. Once in a while one will continue to discharge and then, as said by Dr. Shambaugh, a more radical operation can be performed. The speaker is of the opinion that he treats his share of these cases of disease of the antrum of Highmore and if his observation is worth anything at all it is this, that they will get along far better if water is kept out of these cavities than if the douche is used. We have very sufficient and adequate means of cleansing the cavity by compressed air and every drop of pus can be blown out. It is an easy procedure and his patients have gotten along very much better since he has done that than when he used the douche method.

Dr. George E. Shambaugh asked Dr. Andrews what he did about the home treatment when he used only compressed air to clean out these cavities.

Dr. Andrews replied that he did not have them use any home treatment. He has them come to the office twice or three times a week and that is all the treatment they get. With the method outlined it makes no difference whether they are acute or subacute cases—the treatment is the same.

Dr. Shambaugh said that he considers it very important that the cavity should be thoroughly emptied of water after irrigation, as the water acts as an irritant in keeping up the empyema if allowed to remain in the sinus. The patient should be taught how to tip the head forward and to the opposite side in order to assure the entire emptying of the sinus after irrigation.

Dr. A. M. Corwin thought something should be said in commendation of this excellent paper. Dr. Marquis had in a comprehensive and analytical way gone over these various operations and that kind of a paper is of value and teaches all of us to think. He is inclined to agree very much with what Dr. Andrews had said. He used to irrigate all these cases, but latterly he has discarded that practice very largely. Occasionally he practices it in the office, but does not let the patient do it himself, except in isolated cases. He has observed that it is not mere irrigation; it is not mere drainage that cures these cases, but it is ventilation, as shown by the fact that a good opening in the middle meatus will cure many cases, and the forcing in of the ordinary outside air is an efficient aid.

The speaker agreed with Dr. Shambaugh in his remarks regarding the choice of operation. The more conservative method should be tried first, to be followed later by a more radical open operation if necessary.

It does not seem to him that it is possible, through a large opening in the middle or inferior meatus, with a cannula, to blow every drop of pus out of such a cavity, as suggested by Dr. Andrews, but he does believe that the ventilation does act in a mysterious beneficial way to help nature repair the damage done by infection of the closed cavity.

There is no one practicing this specialty who has not had unfavorable results, even by the most radical methods, and, on the other hand, even by the simplest method, either the Krause or the method through the middle meatus, the most kindly results have been obtained. But where the simpler intranasal operations are not sufficient, the Denker or modified Denker or Caldwell-Luc operation is needed to reveal the pathology.

Dr. Otto J. Stein said that his experience has led him to feel now that he cares less and less to perform all of the radical operations mentioned. He feels that some of the minor operative measures of making large openings through the nose either below or above the inferior turbinate, have saved many of his patients from a more radical procedure. He did not care to enter into the discussion of the choice of these various operations, however. That rests a good deal, as had been stated, upon the pathology and individuality of the operator and probably the thoroughness with which the operation is performed.

Dr. Marquis (closing the discussion) thought the members were pretty much agreed as to the general points he tried to bring out in his paper. He thought, however, he had been a little bit misunderstood by Dr. Shambaugh and Dr. Andrews when they spoke of trying the simpler operations first. Dr. Stein also, he feared, misunderstood him on this point. He did not intend to convey the opinion that every case of suppuration that came into his office, in his opinion, should have the Denker operation performed. Far from it. It is only in cases of last resort. He tries a simpler method first. A great majority of the cases will get well with simple washings, although Dr. Andrews does not believe in them. Dr. Marquis has seen a great many get well in that way. He does not care how the pus is removed, whether by washing or compressed air, a great majority will get well if the pus is gotten out and drainage established. It is the rarest exception that we have to perform a radical operation, but the object of the paper was to bring out in those cases, where the simpler method did not suffice, the radical operation of preference. These patients, when radical operation is required, should be given the benefit of that one which will give them the greatest probability of a cure and allows the operator to control the field of operation under observation.

Dr. Pierce has thought that the Luc-Caldwell gives a better field of operation because it takes away the anterior wall, while the Denker only takes away the nasal wall and the opening around the pyriform aperture. The very object of the Denker operation is that you can carry that opening just as far as you want, clear back to the molar teeth if necessary. You can take the entire anterior wall off, if you want, and get an opening which brings it out in front of you. We all know that we have had trouble in these cases that do not get well because of some little focus in the anterior angle, and that is bound to stay in a Luc-Caldwell operation. But in the Denker operation there is no question but that you have every part of it under observation.

As to the question of removal of the entire membrane the speaker did not want to be understood as doing that. There, again, is the very object of the Denker operation, because it allows the operator to see what membrane to remove and what to leave. He is not working in the dark. The object of this operation is that you can work under the control of the eye and see which parts you want to remove and which should be allowed to remain. That, he thinks, is one of the strong points of the Denker operation.

As to the flap: As he said in his paper, he was opposed to it; he has been converted, and hopes others will be. He has better results in healing with his present method.

Denker only insists on the removal of the membrane of the floor and the healing of the flap will take place. Only the diseased membrane is removed.

Regarding packing he read an article in a journal a short time ago—a discussion from Uffenorde, Hajek and Onodi—on the subject of nasal packing following operation, and they all said they did not believe in packing and did not practice it. He has been with all of those men and never saw them operate on a case without packing. They all do it. He did not mean that the gentlemen present used packing, but there is a great deal of talk about not packing in the nose, and then a great many men do it afterwards. Personally, he believes with Dr. Robertson that if one is going to use a flap, a carefully applied dressing to retain the flap in position and at the same time promote drainage (don't call it a pack) will promote healing. So far as the rest of the points of the operation are concerned he thinks that they are all agreed.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting Nov. 16, 1914—Continued.

INTRANASAL OPERATION FOR DACRYOCYSTITIS.

Dr. Frank E. Brawley reported the case of a woman, fifty years of age, who had dacryocystitis of nearly a year's standing. Local treatment for several weeks was without avail. The dacryocystitis was controlled by syringing, but it was impossible to pass a probe through the nasal duct. Two weeks ago last Thursday he did intranasal opening of the tear sac, dissecting up the mucoperiosteum for about a centimeter square and the anterior attachment of the middle turbinate. Instead of using the chisel method of West, he made use of a cutting bur such as was used in mastoid operations. This bur was made of the proper length to reach the area. He cut through with this long bur very quickly, enlarged the bone opening up and down and sideways, and there was no cutting into the tear sac at all. Today there were slight evidences of reaction, some thickening at the margin of the bony wound, but tear drainage was perfect.

DISCUSSION.

Dr. Joseph C. Beck had operated on four cases of dacryocystitis by a method a little different from the one described by Dr. Brawley. The last case was a boy, six years of age, who had had chronic dacryocystitis since he was a year old. There was no benefit from the usual treatment. Patient had ulcerative rhinitis in infancy. The naris was very small. It was now two weeks since the operation was done, and it was too early to judge whether the opening was going to remain patent.

Dr. J. Sheldon Clark, Freeport, said in cases where the bone was heavy or thick the bur would be of some advantage, but where one had thinner bone to deal with, the chisel would serve the purpose nicely, and in such cases he had had no trouble in using that instrument.

Dr. Oliver O. Tydings said it was more satisfactory to the operator and more comfort to the patient to use the bur whenever it was possible to do so.

Dr. Michael Goldenburg saw a number of cases last summer that had been operated on by different men, and some of them had been under treatment for nine months after the operation. He examined the noses of some of these patients and found pus flowing freely over the middle turbinate and going on through the middle meatus. He failed to see the advantage of the intranasal operation over the external operation. The advocates of the intranasal operation claimed that the only advantage was it did not leave an external scar.

Dr. Oliver O. Tydings stated that some years ago he operated on a case of forty years' standing. There was no reason why there should be a constant flow of pus if the opening was made at the bottom of the canal and drained. There would be free drainage and one would get rid of pus.

Dr. Willis O. Nance asked Dr. Goldenburg as to the result in the cases he had seen relative to the relief of the epiphora.

Dr. Goldenburg said he was in Killian's clinic and saw two patients, one of whom was having trouble all the time from epiphora.

Dr. Harry S. Gradle saw half a dozen cases that were operated on by West in Hirschberg's clinic, and in these the epiphora was relieved and the tear passage restored.

Dr. Brawley stated that some of the cases mentioned by Dr. Goldenburg might be explained on the ground of ethmoidal infection, and they had not been properly handled. There might be cases in which there was considerable necrosis in the lachrymal fossa, but with the bur operation, if there was necrosis and soft bone, it would be easy to remove it, so that we would not expect to have a chronic discharge.

CAVERNOUS SINUS THROMBOSIS AND THE FUTURE.

Dr. Henry Glover Langworthy, Dubuque, Iowa, stated that the study of cavernous sinus thrombosis had been limited in the past. First, because the cases were rare and the average physician in a lifetime would scarcely see more than two or three sufferers with the disease. Second, few men even today really considered the sinus available for surgical interference, especially when the patient might seem already in a septic moribund condition and the cavernous sinus itself only one of a number involved.

After speaking of the symptoms, the author stated that in making the diagnosis of a given case even without previous experience, one might formulate this rule: When there was increasing exophthalmos and lid edema on the same side as a somewhat distant infecting focus, any edema of the face and neck, septic temperature, and the slightest evidence of beginning lid edema or exophthalmos of the opposite eye, we were safe in saying that the later positive symptoms of cavernous sinus thrombosis were present beyond a doubt. A fairly early diagnosis in cases where the infection originated posteriorly about the ear or back of the neck was comparatively easy and should present no difficulty.

The prognosis was bad, and the mortality ninety-nine per cent. For all working purposes the mortality under present conditions should be considered one hundred per cent.

As possible operative routes to attack the sinus or methods of treating the same, the following were mentioned as still to be perfected: Mosher's proposed anterior route through the orbit, Hartley-Krause Gasserian ganglion route through the side of the skull, and the Luc-Langworthy route upward through one side of the nose and sphenoidal cavity, and lastly in certain otitic cases energetic treatment of the original focus alone from behind, namely, by opening the lateral sinus and jugular bulb thoroughly and resecting the internal jugular vein.

If we were to progress in the treatment of so baffling a disease, the author said we must rigidly adhere to three cardinal points connected with it: 1. Standing flat-footed upon a reasonably positive diagnosis as early in the disease as possible. 2. Viewing the sinus as we would any other large vessel which had become thrombotic. 3. Following routinely that operative path which seemed to the surgeon in charge as best fitted for drainage.

At the present time, and looking fearlessly into the future, it would seem wise until more evidence to the contrary was produced to look upon these cases with increasing hopefulness and as offering surgical opportunities which should not be ignored.

Dr. Albert E. Halstead had seen a number of cases of thrombosis of the cavernous sinus, most of them the result of trauma. Two cases were the result of gunshot wounds. One was a gunshot wound of the ear in which the bullet passed through the middle ear, struck the greater wing of the sphenoid after penetrating the ganglion and lodged in the sinus cavity. Another was a gunshot wound of the temporal region in which the sinus was injured and patient developed sinus thrombosis. At first, patient lost one eye, then the other, and finally recovered after both eyes had been removed. The patient with a gunshot wound of the ear lived for about two weeks. He developed what the speaker supposed to be, in addition to sinus thrombosis, brain abscess. He operated because of the brain abscess, and not because of the sinus thrombosis. He exposed the sinus easily by the usual route used in reaching the Gasserian ganglion and was able to scrape out all the sinus and remove the bullet, which was lodged in the sphenoid bone, but the patient died of meningitis. He had had meningitis before operation, but the speaker was not aware of the extent of it. He had had two cases, besides these two, of gunshot wounds, that got well without operation, which demonstrated to him conclusively that patients with thrombosis of the cavernous sinus might recover spontaneously.

Dr. Joseph C. Beck spoke of a method which he had de-

veloped of reaching the hypophysis by way of the antrum following the Henson operation, and had operated successfully on two cases of hypophyseal tumor of the glandular region. One patient recovered his vision; the other had since died from progressive sarcoma which began in the hypophysis and the greater part of the tumor was found in the cerebral portion.

Dr. John R. Fletcher stated that as soon as he saw Dr. Kanavel operate on the living for tumor of the hypophysis, he went to the dead house and undertook the same operation upon the dead, and found the route through the nose on the dead subject not very difficult. There he had no difficulty with hemorrhage which was likely to occur in the living subject. Since then he had done the operation several times upon the cadaver and had also followed the route referred to by Dr. Beck in reaching the hypophysis. In the first operation he did, following that of Dr. Kanavel's on the living, he not only went through the nose but through the Gasserian ganglion region and was able to demonstrate that case. The specimen was shown several years ago before the Chicago Medical Society.

Dr. Langworthy, in closing, said it would seem that some cases of thrombosis of the cavernous sinus were amenable to surgical treatment, while others were not. The operator must decide that question for himself.

THE OCULAR MANIFESTATIONS OF DISEASES OF THE NASAL ACCESSORY SINUSES.

Dr. Richard J. Tivnen read a paper on this subject, which was illustrated by stereopticon views showing the anatomic relations of the structures discussed.

In a consideration of the ocular manifestations of nasal accessory sinuses, of prime importance was the anatomic relation of these cavities to the ocular structures. This relation was a very intimate one and suggested at once a great likelihood of extension of pathologic processes from such closely allied structures. Apart from this close anatomic relation, ocular manifestations, occurring in common with sinus disease, had been explained by many varied theories. These comprised in the main as their basic principle disturbed drainage from the sinus with its attendant interference with physiologic function, and the varied circulatory manifestations which such processes entailed. The disturbance to ocular structures consequent upon sinus disease practically might include every tissue and structure of the eye and orbit. In the lids, causing redness and edema; in the muscles, weakness, paresis, disturbance of accommodation; in the globe, ex or en-ophthalmos of various types; in the orbit, abscess, cellulitis; in the uveal tract, iritis, irido-cyclitis, uveitis, etc.; in the optic nerve, neuro-retinitis; in the choroid and retina, chorio-retinitis, etc.; in the cornea, keratitis and abscess.

The symptomatology was influenced by the location, extent and severity of the particular process and ranged from slight asthenopic symptoms, such as blurring on use of the eyes, to absolute blindness.

The essayist at this point exhibited stereopticon slides showing the intimate anatomic relation of the sinuses to the orbit and ocular structures.

Many eye cases of this class were labeled hypochondriacs and their distressing complaints were considered imaginary or greatly exaggerated. A more careful study of this type of case would disclose that many of them were afflicted with sinus disease, with secondary ocular manifestations. Apart from the specific pathology of the individual structure involved, there was quite commonly present in such cases a toxemia, which might manifest itself in such vague symptoms as depression, lassitude, inability to concentrate, etc. The conspicuous role played by certain structures, notably the tonsil and teeth, in the production of general systemic infections was nowadays well recognized. Guided by these experiences and keeping constantly in mind the exceeding vulnerability of these neighboring structures, the relative frequency of sinus involvement, and the fact that often these involvements did not frankly disclose themselves, the intimate anatomic relation of the structures, would frequently serve to direct the attention of the ophthalmologist to these parts as possible focal points in many obscure ocular lesions.

In summarizing, the author felt the following conclusions were warranted: 1. Interrogating the nasal accessory sinuses in all disturbances of the eye and orbit of an obscure nature. 2. Obtaining a clear history of the ocular manifestations, regarding such symptoms as frequent head colds, headaches, etc., associated with the outbreaks of the ocular trouble, as suggestive of sinus complications. 3. Cooperation in all obscure eye cases with the rhinologist, the otologist and oral surgeon. The value of such team work could not be over-estimated. 4. A careful ocular examination, particularly the examination of the fields of vision for form and color.

Dr. Nelson M. Black, Milwaukee, Wis., gave a demonstration of the transmission qualities of the glass used for railroad signaling, and that worn for protection by employees in railway service and other industries where protection from intense light was necessary. He discussed radiation and the spectrum of radiant energy. The properties of colors or color constants were applied to railway signals, illustrated by a chart showing transmission at the various Fraunhofer lines. He spoke of the future of railway signaling and the necessity of absolute elimination of all color blind in railway service. Attention was given to the factors which interfere with the visibility of the signals and the protective measures used. He pointed out the necessity of a protective glass which would not interfere with the intensity and hue of a color signal and thus reduce the range.

AN UNUSUAL FORM OF PERSISTENT CAPSULO-PUPILLARY MEMBRANE.

Dr. L. E. Barnes reported this case. The patient, H. D., was thirteen years of age. Erysipelas at three weeks of age following a scalding burn; mushroom poisoning at five years of age. Patient's history and family history negative. Both eyes normal externally, anterior chambers normal, and pupils dilate well under atropin.

Right eye. Underneath the anterior capsule in the pupillary area in a horizontal line were three punctate opacities of the lens. In the upper nasal

quadrant was a subcapsular opacity, irregular in outline, two millimeters in diameter and one-half millimeter deep. From the upper inner edge ran a broad flat band of opacity. First it went directly back, then downward and back, terminating in a point just in front of the posterior capsule. This opacity was irregular in outline and seemed to have a central zone of opaque tissue surrounded by flocculent opacities. The rest of the lens was normal in size and shape. The edge of the lens did not appear to be nicked like a coloboma. The opacity did not interfere with central vision. The fundus was normal. The eye was hyperopic + 150 D. The left eye was similar to the right, only there was an additional opacity that appeared to encircle the nucleus of the lens. The irregular opaque fibres were more fibrillar than in the right eye, with less surrounding corneal opacities. The ophthalmic literature at the author's command for the last five years contained no reports of a similar embryological case.

PAUL GUILFORD,
Secretary.

Regular Meeting, Dec. 14, 1914.

A regular meeting was held December 14, 1914, with the president, Dr. Wesley Hamilton Peck, in the chair.

Dr. John R. Hoffman presented a case which showed the invariable short period of healing after an intracapsular cataract extraction. He operated on the patient, Dr. B., on the fourth instant, this being the eleventh day. A preliminary iridectomy had been done some months previously, but because of unavoidable delays the extraction was not done as early as contemplated.

In the operation he followed the technic as described by Dr. Vail of Cincinnati, with the modifications and instruments devised and used by Dr. William A. Fisher, with the departure from the latter in so far that the spring speculum was used while making the incision. The author had made it a rule to use the retractor in this step of the operation. The reason for the departure at this time was the fact that the patient did not stand the retractor well. It was tried several times after recocainizing the eyes before proceeding with the operation, but the patient exhibited a great deal of uneasiness every time. On trying the speculum, however, the irritation was not so severe and patient was quiet. After making the incision after the method of Smith, the speculum was replaced by the Fisher lid-hook and the author proceeded to deliver the lens according to the procedure described by the tumbler class, as the lens appeared to be of the intumescent variety which readily tumbled. Placing the point of the extracting hook over the border of the lens and making pressure directly downward towards the feet, the capsule readily gave way below, and the lower edge of the lens presented in the wound first, making the delivery practically free from danger of loss of vitreous, as the upper part of the capsule was ruptured in this class after the lens was out of the wound, and the eye being turned up, there was no pressure exerted on that medium. After making the usual toilet of the wound, which consisted in replacing the pillars of the iris coloboma with the iris repositor, both eyes were dressed with yellow oxid of mercury ointment over the palpebral fissures and gauze pads and the patient was put to bed.

The patient exhibited no discomfort during his period of confinement to bed for the usual nine days.

The dressing was not disturbed until the ninth day, when on removing it the wound was found healed, and the eye presented none of the irritable conditions present in a large number of cases after the extracapsular operation. Examination of the media showed everything clear, and vision without a lens was at 6 feet, with a plus 10.00 it was 20/30. The case was typical of the healing in successful intracapsular operations.

The author was convinced from the moderate experience he had had with the operation that any one who had had experience with the older methods of extraction, and desired to do it, would be successful if he followed the technic of Vail and Fisher, with an assistant who would study carefully the method of holding the lid hook.

DISCUSSION.

Dr. William A. Fisher stated that the corneal wound had healed and the patient had recovered from the operation without the slightest irritation or inflammation. The eyes were bandaged for nine days after the operation, and tonight, eleven days after the operation, the patient seemed to be in a condition to be discharged. The fundus could be seen with the ophthalmoscope, and there was no capsule to interfere with his vision or cause him to return for a secondary operation. Patient's vision was 20/40 with correction and it was fair to presume that he would have 20/20 within the next two weeks.

Many operators would be glad to adopt the intracapsular operation as a method of choice provided they could safely perform it. He was pleased to know that Doctors Hoffman, Tydings, Gradle and Suker were doing the intracapsular operation, and he believed many more would be doing it in a short time, provided the technic was mastered while doing the old operation.

To remove a lens in its capsule required a perfect technic and it could be mastered by good operators, provided they adhered strictly to the Smith teaching. More losses of vitreous would occur to anyone beginning the new operation, but the absence of postoperative inflammation would more than counterbalance the trouble caused by a slight loss of vitreous. Both eyes should be kept bandaged for nine days after the operation whether the lens had been removed in its capsule or the needle had been used. In thirty consecutive operations postoperative inflammation followed only in one case, and that was one that had a prolapsed iris which recovered with 20/20 vision. He did not recommend his needle except in cases where safe pressure had been used and the lens would not move. The more expert one became the less often would he be called upon to use the needle.

TYPICAL ALBUMINURIC RETINITIS FUNDUS WITH NEGATIVE FINDINGS

Dr. Michael Goldenburg presented a patient, H. W., aged 37, coppersmith helper, who came into

the clinic with the history of his sight becoming hazy in the left eye. Vision in the right eye had always been bad and when hunting patient was compelled to use his left eye. Vision at this time was 10/200 in each eye. Pupils were dilated with homatrophine and fundi examined. The right was found to be negative and with a high degree of hyperopia.

In the left the author found a marked neuroretinitis with many hemorrhages which were limited to the circumference of about two papillary diameters of the disc. The peripheral part of the fundus was free of hemorrhages; the vessels were tortuous and the veins dilated, resembling to a marked extent a mild form of thrombus of the central retinal vein. Eight days later the fundus again was examined and found most of the hemorrhages absorbed, with a beautiful stellate glistening white deposit in the macular region, a typical picture of albuminuric retinitis.

Refraction:

O. D. 10/200 + 6.00 = + 1.50 Ax. 90 20/100.

O. S. 10/200 + .75 = + .50 Ax. 90 20/100.

Wassermann negative.

Urinalysis was made five times and all were negative in every respect. A twenty-four hour specimen was used. The average specific gravity was 1020.

The ethmoids and sphenoids manifested nothing upon inspection or x-ray plate. Blood pressure, 125; heart negative; fields contracted and no central scotoma for red or green; as to the brain, there were no signs or symptoms that would suggest a brain tumor. General physical condition of patient good.

DISCUSSION.

Dr. Clark W. Hawley thought that the case reported by Dr. Goldenburg was similar to two cases that he reported to the society some time ago. The description about the macula of Dr. Goldenburg's case was typical of the effect due to some toxemia. The stellate appearance of the exudate about the macula, according to the description, was perfect of the appearance about the macula of the speaker's two cases. The cause of the condition in his two cases was due to toxemia from the lower bowel. The first case was cured by an osteopath curing up a severe constipation. The second case he cured by a course of calomel. In both cases the exudate about the macula disappeared.

SOME EXPERIENCES WITH THE INTRANASAL PARTIAL RESECTION OF THE TEAR SAC.

Dr. J. Sheldon Clark, Freeport, Illinois, read a paper on this subject in which he summarized as follows:

What was to be expected from resection of the tear sac intranasally? 1. A functionating tear apparatus was the foremost attainment. 2. There was no possibility of an external scar, nor did the patient or the doctor have a dread that there would be a resultant scar. 3. There was no epiphora following the operation. 4. There was no possibility of having to do a secondary operation upon the lachrymal gland on account of the troublesome epiphora. 5. Epiphora due to stenosis was readily cured by this procedure. 6. No other procedure would admit of trial in the presence of phlegmon. with the intranasal operation one might operate where there was phlegmon without fear and successfully. 7. A patient with tear sac trouble was very much more apt to accept the intranasal route than he was the external operation for the total excision of the sac.

DISCUSSION.

Dr. H. W. Woodruff, of Joliet, Illinois, had seen the results in two cases operated on by this method, and said they were good in both. The first one was operated by Dr. Clark at the Eye and Ear Infirmary last June, and the other one was shown here by Dr. Brawley one month ago. Whether this operation or other intranasal operations on the tear sac would entirely supersede the extirpation of the sac externally, was doubtful.

It would probably be contraindicated in dacryocystitis with cataract as a prophylactic measure before the cataract extraction. The extirpation would be more certain of removing a dangerous infective focus. It would be an ideal operation, however, in certain cases of epiphora with stricture, but without dacryocystitis. Such cases, for instance, which had been repeatedly probed without benefit and in which the eyes were constantly suffused with tears, would be greatly benefited by this operation. He would like to see this operation tried on such cases.

Dr. F. C. Todd, of Minneapolis, said he had not as yet performed the West operation and he was waiting until he could see it demonstrated by Dr. Clark, who had accepted an invitation to come to Minneapolis next month. The operation appealed to him as a rational procedure in cases where it was indicated. He intended to give it a fair trial. He would be disappointed if it did not meet his expectations as it seemed in many respects preferable to older forms of treatment. It was distinctly an operation for the rhinologist.

Dr. Richard J. Tivnen stated that the procedures at present in vogue for the relief of chronic interference with the drainage of the tear sac, and its associated disturbances, were far from perfect or satisfactory. The plan of the intranasal operation described by Dr. Clark which had as its basic idea the short circuiting of the duct, with the end in view of providing a functionating tear apparatus, appeared sound and scientific. The chief advantages it offered were the preserving of a drainage outlet, the avoidance of a scar externally, and its almost universal availability.

As to septal deflections, particularly those situated superiorly in the nasal fossae, they usually demanded operative correction before the operation on the duct could be successfully conducted. Since such deflections were commonly met with, this additional requisite operative interference might militate against the popularity of the procedure.

He should be glad to know from Dr. Clark what the real practical technical difficulties of the operation were.

Dr. Frank Brawley wished to ask Dr. Clark to give the after treatment more in detail. In the case operated by Dr. Brawley and presented at the November meeting, there had been some trouble with granulations covering the bone wound and these had been controlled with silver nitrate fused on a probe. To date, this case had shown no further evidences of pus, fluids could be syringed into the nose easily and the fluorescin test was positive, though required several minutes.

Dr. J. A. Pratt, Aurora, Illinois, heartily endorsed the intranasal drainage of the lachrymal sac. Although both times he was in Vienna he took the operative work of the excision of the lachrymal sac under Dr. Meller, he had never practiced the operation for the ultimate result of the continual toilet of the eye, and the lack of drainage of the conjunctival sac never appealed to him, and he had relied upon dilatation and the style.

Three weeks ago he did the West operation on a patient who had had unsatisfactory results with the scar, with the most happy results. The patient now was entirely free of her trouble. The operation was performed as Dr. Clark had described up to the point of opening the sac, when he found he could not grasp the sac with the West forceps. He had the assistant push out the sac with the probe as directed and then he curetted through the sac with a small sharp probe as directed.

In his opinion when we had established this short route drainage into the nose, we would cure nearly all the ills of the lachrymal sac.

Dr. R. H. Good expressed the opinion that in the near future most diseases of the lachrymal sac requiring surgery would be operated intranasally. He objected to the term resection of the sac because it was misleading, in that it left the impression that the entire sac was resected. In reality it amounted to simply slitting the sac.

In regard to the employment of morphin before operating on the nose and throat, he had abandoned this some years ago on account of the fact that the patient might have a severe hemorrhage after being placed in bed and being in a drowsy condition, swallow the blood without the nurse or the patient knowing that it was a hemorrhage.

Dr. Yankum had brought out the point that many of the tear sac troubles were due to the closure of the nasal duct on account of the bony foramen being too small. By removing the nasal bony wall of this foramen and slitting the duct all the way up into the sac, it had given good results without the more radical procedure of resecting a part of the sac.

The use of the bur for the West operation accomplished the same results and could be much quicker and more easily performed.

Dr. Clark, in closing the discussion, stated that the operation was of the greatest value in dacryocystitis as a preliminary to cataract extraction, as well as in the other conditions named in the paper. In fact, this was one of the conditions best suited to the intranasal procedure.

As to the details of the after treatment, there was nothing particularly different to add from what was given in the paper. Excessive granulations should be combated here as in other nasal work.

The operation was not so highly technical, and yet it was one which should only be done by those who are accustomed to working high up in the nose. As in some other nasal operations one should be able to "see with his fingers" as well as by the aid of direct vision. He spoke of the possibility in some instances, of having to do more than the simple work on the floor of the sac. Occasionally a high submucous partial resection of the septum would have to be made, and the pyriform process and the anterior end of the middle turbinate would have to be resected.

As to its applicability in so-called hernias of the sac, in all this work it was simply a question of drainage and once this was established and maintained, it was like it was in other situations in the body, in that healing took place. One of the points made was that this operation was indicated in the presence of phlegmon, or where the process had extended beyond the sac.

THE LOCALIZATION OF FOREIGN BODIES IN THE EYE.

Dr. Hollis E. Potter stated that steel, iron, iron rust, copper, brass, cement, stone, glass and wood were the most common bodies met with. Of these, wood was invisible unless painted. Glass, stone and cement were of medium density, but were visible in any appreciable quantity. The heavy metals were easily demonstrated.

Magnetic bodies, such as iron and steel, were not infrequently shown by x-rays when negative to the magnet test. When removed by magnets a previous knowledge of the position permitted an extraction with minimum laceration.

When sclerotomy was necessary before the extraction, accurate localization was of prime importance. The present day atrophy was sufficient as a guide for sclerotomy.

Simple plates were useless for accurate or even approximate localization. Some mechanical system must be adopted. The system as devised and perfected by Sweet was most accurate and easily used. One who did this work should localize every case he could so as to become proficient and uniformly dependable.

The author demonstrated two of the latest types of Sweet's localization apparatus. He also demonstrated several plates, lantern slides and charts.

DISCUSSION.

Dr. Richard J. Tivnen stated that the value of the x-ray as an aid in diagnosis of foreign bodies involving the ocular structures was well recognized. The radiologist had perfected his technic and overcame the difficulties of localization of the foreign body to such a degree that it was now possible for the ophthalmologist to look forward with confidence in such cases for exceedingly valuable assistance from this source. The painstaking and instructive presentation of the subject by Dr. Potter deserved commendation and support.

He thought all ophthalmologists had reached the conclusion that skiagraphs of the eye, in so far as the diagnosis and localization of foreign bodies were concerned, belonged to the domain of radiology quite apart from the rest of the science, and that men who became competent in this branch of the subject should be recognized as specialists in this particular field of radiology. This being true, it would seem the part of wisdom for the ophthalmologist to support in a practical way those men who are willing to specialize in this subject and who were willing to cooperate with ophthalmologists in solving the problems which this class of cases presented.

It had been his experience that one skiagraph was oftentimes insufficient to establish a positive diagnosis, and in all doubtful cases he insisted upon at least two. Numerous experiences had shown the utter unreliability of accepting as conclusive either the statements of the patient, the presence or absence of a wound of entrance, the negative response of the magnet and even the negative x-ray plate. The average case, however, would be discovered by an exhaustive interrogation of these several clinical evidences.

In all suspected foreign body cases he had come to follow as a routine procedure, first, obtaining a complete history of the accident, with especial reference to accounting for the foreign body; second, making a thorough examination, including the visual acuity, tension, fundus, etc.; third, making skiagraphs, two or more, in doubtful cases, and fourth, applying the electric magnet.

The surgeon should learn to interpret the skiagraph himself, as such a study would well repay the effort expended.

Paul Guilford,
Secretary.

DE KALB COUNTY.

The De Kalb County Medical Society met in regular session at the city hall, De Kalb, Friday, January 29, 1915. Meeting called to order by Vice-President L. E. Barton, with the following members present: Drs. C. E. Smith, J. M. Everitt, O. J. Brown, M. C. Munn, J. A. Badgley, J. S. Rankin, J. H. Riley, L. E. Barton and J. B. Hagey.

Dr. Clifford Smith presented a paper on "Concom-

itant Squint," illustrating the same with clinical cases, which showed very conclusively the clever work being done by him. An interesting discussion, followed by Drs. C. B. Brown, J. M. Everett, L. E. Barton and O. J. Brown.

Dr. Barton showed an x-ray photograph of a tack lodged in the right bronchus of a child. The patient was operated on eight weeks after accident and tack was removed by low tracheotomy with complete recovery.

The following were voted into the society: Dr. H. W. Trigger, Sycamore; Dr. Willis, Fairdale, and Drs. Down and Dinny, Sandwich. The board of censors were instructed to report on Dr. J. M. Postle's application for membership at next meeting.

The secretary was instructed to send flowers at his discretion to sick members of the society; also to give official notice of the death of a member to the ILLINOIS MEDICAL JOURNAL and to send a floral tribute to the family of the deceased. Upon the death of a member resolutions of the society were to be published in a county paper. The secretary was empowered to give a dinner to members of the society when he should deem it convenient to do so, in order to foster good fellowship.

Next meeting to be in Sycamore on the last Friday in April, 1915.

J. B. HAGEY,
Secretary.

HARDIN COUNTY.

Your recollection of any previous report from this society is, perhaps, not vivid.

We have a membership of two—president and secretary-treasurer.

Meetings are held daily.

Hours, any that suit our convenience.

Subjects discussed, miscellaneous and general. We don't follow the post-graduate course very closely.

Attendance, the entire membership.

Those taking part in the discussions, both of us. The president generally leads and closes the discussion.

Place of meeting, store of Paris Drug Company.

Social and ethical relations, the most congenial.

Next regular meeting, tomorrow.

(Signed) BOTH OF US.

LAKE COUNTY.

The Lake County Medical Society held its regular quarterly meeting January 27, 1915, at the Y. M. C. A. clubrooms in Waukegan. The entire program was given over to the subject of "Fractures" and all the papers were read by local men. Needless to say, it was an interesting as well as an enthusiastic session.

The following members were present: Drs. Barker, Bellows, Bouton, Brown, Budde, Ambrose, Foley, Gourley, Gavin, Kalowsky, O'Neil, H. B. Roberts, Sheldon, Taylor, Tombaugh, Wright and Watterson. At 7 p. m. a delicious turkey dinner was served by the ladies of the Presbyterian church.

After dinner President Taylor called the meeting to order and we proceeded with the general order of business. Drs. R. B. Jacks, Highwood, and H. J. Ullmann and John P. O'Neil of Highland Park were elected to membership. Dr. L. T. Tombaugh gave a short talk on the benefits afforded us as members through legal protection by the state society. The following program was then given and only the absent members were the losers, for the subjects were treated in a most thorough and painstaking manner and many interesting as well as useful points were brought out on this particular branch of practice, which often proves a bugbear to the profession as it is so productive of malpractice suits:

"Treatment of Fracture by Lane Plate," Dr. J. C. Foley. Discussion opened by Dr. F. L. Gourley.

"Fractures Involving Hip Joint," Dr. E. F. Gavin. Discussion opened by Dr. J. P. O'Neil.

"Colles' Fracture," Dr. J. L. Taylor. Discussion opened by Dr. F. M. Barker.

"Fractures of Clavicle," Dr. H. B. Roberts. Discussion opened by Dr. L. T. Tombaugh.

Discussion of the papers was entered into heartily by all present and, taking it all in all, the meeting was quite a success.

Our next meeting will be held in Highland Park early in April.

C. S. AMBROSE,
Secretary-Treasurer.

MADISON COUNTY.

The February meeting of the Madison County Medical Society, held in Venice on February 5, was highly successful and was largely attended. Considering the inclement weather and the fact that Venice is in an extreme corner of the county, the attendance was all that could be desired, much to the pratification of the local profession. Dr. John P. Hale of Alton was elected to membership and Dr. E. A. Cook of Alton was appointed to represent our society in the section of public health and hygiene at the next annual meeting of the state society. The committee on stereopticon was instructed to renew their investigation and was given power to act. Dr. Heber Robarts of Belleville gave a lecture on "Radium," which was very instructive and highly appreciated. He exhibited many pictures taken before and after treatment, showing what could be done with this agent.

Dr. George W. Cale, Jr., of St. Louis, read a paper on "Fractures," demonstrating the Lane method of "bone plating." He illustrated his subject by exhibiting many x-ray photographs, showing the original fracture and the end result after plating. Great interest was shown throughout the whole session and the discussion that followed both efforts was spontaneous and spirited. The absence of a stereopticon was deeply deplored, as its use would have added much to the elucidation of both subjects.

Those present were: Drs. Harrison, Luster, Burroughs, Schreifels, Siegel, Kerchner, J. W. Scott, R. B. Scott, Cook, E. F. Fischer, Reuss, Dorr, Johnson,

Riley, Hamm, Theodoroff, Hirsch, Binney, W. H. C. Smith, Barnsback, Ferguson, Baker, Kiser, Schroeder, Lemen and E. W. Fiegenbaum. Visitors: Dr. George W. Cale, Jr., of St. Louis, and Dr. and Mrs. Heber Robarts and Dr. A. L. Reuss, of Belleville

Our March meeting will be held in Granite City on March 5, 1915.

E. W. FIEGENBAUM,
Secretary.

MORGAN COUNTY.

Regular Meeting, January 24, 1915.

The Morgan County Medical Society met January 14, 1915, at 8 p. m., nineteen members present.

The paper of the evening was read by Dr. J. M. Elder of Franklin, Ill., on "The Treatment of Croupous Pneumonia." Dr. Elder gave a detailed account of his treatment. The paper was discussed by Drs. D. E. Baxter, C. E. Cole, E. L. Crouch, T. J. Pitner, H. C. Woltman and G. H. Stacy.

THOMAS G. MCLIN,
Secretary.

Regular Meeting, February 11, 1915.

The Morgan County Medical Society met in regular session February 11, 1915, with twenty-four members present; visitors, Dr. Wilma H. Jacobs of Jacksonville, recently from Wilmington, and Dr. W. H. Garrison of Pearle, Ill; also a large number of veterinaries, dairymen, and other interested parties. Total number present, 78.

The lung motor, recently placed at the disposal of the city by the traction company, was demonstrated, and the society recommended that it be placed with the ambulance, where it could be most readily transferred to any part of the city.

Dr. E. J. Strickler was elected to membership by transfer from Hardin county, Kentucky.

Papers of the evening on "Foot and Mouth Disease" were read by W. B. Holmes, D. V. S., and Walter L. Frank, M. D., Dr. Holmes reviewing the subject from a veterinarian view and Dr. Frank reviewing it in relation to its occurrence in man. C. E. Scott, D. V. S., of Jacksonville, led the discussion and gave his experience with the disease in this county. Stated that he was called to see a bull and made a diagnosis of foot and mouth disease, and called a Federal man who confirmed the diagnosis. Within a few days almost the entire dairy was affected, showing the rapidity of the spread of the epidemic.

In the discussion which followed, Dr. Holmes and Dr. Frank were asked whether the disease had occurred in man during this epidemic. Dr. Holmes said that Adolphus Casper, D. V. S., stated that one child near Tallula, Ill., had contracted the disease from infected milk. It is not known whether or not this case has been reported in medical literature. No other case was mentioned.

Dr. King, city health warden, asked what should be done in case someone developed the disease in this city. Strict quarantine regulations were advised. Some thought it was not necessary, as the disease is quite rare in man, considering its prevalence in animals.

Mr. C. A. Rowe emphasized the possibility of dogs spreading the disease from one herd to another and advocated the desirability of legislation against stray dogs.

THOMAS G. MCLIN, M. D.,
Secretary.

VERMILION COUNTY.

The Vermilion County Medical Society met February 8 in the city council chamber, Danville, and was called to order by President Jones. The minutes of the January meeting was read and approved. Applications for membership by Drs. H. B. and Maggie Downs were read and referred to the Board of Censors. An extensive communication from the State Board of Health, in regard to illegal practitioners, was read. The motion passed that the president appoint a committee to wait on the state's attorney relative to illegal practice cases, as there were no funds with which to employ attorneys in these cases. The president appointed on this committee Drs. Coolley, Morton, F. N. Cloyd, W. J. Brown and J. M. Guy. Communication from Dr. R. A. Brown of Humrick was read. Motion that the society remit Dr. Brown's dues for 1914 and that secretary so infrom Dr. Brown, on account of Dr. Brown's continued illness, was passed.

Program for the evening:

"Foreign Bodies in the Eye," Dr. C. P. Hoffman. Dr. Hoffman was absent.

"Diseases of the Tonsils," Drs. Clark and Gleeson.

The papers were instructive and interesting and were very thoroughly discussed by Drs. Morton, Dale, Guy, Current and Fisher. Cases were reported by Drs. Gleeson, Guy, Miller and Crist. Dr. Gleeson's case of sarcoma of the tonsil which had been treated for quinsy successfully removed. Dr. Guy, case of ununited fracture in a diabetic, successfully treated at St. Elizabeth's clinic in 1914. Miller, case of pancreatic cyst. Crist, pyelonephrosis kidney simulating appendiceal abscess.

Dr. Morton spoke of the destitute condition of the Belgian physicians and moved that we send $20 to their relief fund. This motion was amended by Dr. Miller to read that this be made $25. Both motions carried, and the secretary was instructed to send this money.

The April clinic to be held at St. Elizabeth's Hospital was discussed and Dr. Dale was appointed to confer with the Sister Superior on the matter and to report to the president.

Nineteen members were present, including Drs. Clark, Gleeson, Coolley, Dale, Satterlee, Brant, Fisher, Vogt, Hole, Lenhart, Cass, Guy, Morton, F. N. Cloyd, Jones, Crist, W. J. Brown, Chaffee and A. M. Miller. One visitor, Dr. Effie Current.

Meeting adjourned in form.

O. H. CRIST,
Secretary.

WINNEBAGO, BOONE, KANE, McHENRY AND STEPHENSON COUNTIES.

A joint meeting of the medical societies of Boone, Kane, McHenry, Stephenson and Winnebago counties was held at Unity Hall, Rockford, Tuesday, February 9, at 10 a. m. Owing to the unavoidable absence of the local president, Dr. H. M. Starkey, who was out of the city, Vice-President Dr. E. W. Goembel served as temporary chairman. Sixty local doctors and some thirty visiting doctors were in attendance.

The first speaker on the program was Mr. Frank Bertrand of Rockford, deputy internal revenue collector, who had kindly consented to talk on the Harrison Narcotic Drug Law recently passed in congress. Local druggists and nurses had also been invited to attend this feature. Following Mr. Bertrand's address the doctors partook of luncheon in Unity Hall dining room.

At one o'clock the regular session began. Dr. Emil Windmueller of Woodstock, councilor of first council district, was asked by Dr. Goembel to serve as chairman. Dr. Windmueller called upon the local secretary to read a letter from Dr. H. M. Starkey, who was in Washington, D. C. This letter expressed greetings to all present and a hearty welcome to all visiting doctors. The following program was then rendered:

1. Address of welcome. Dr. D. Lichty, Rockford.
2. Address. Dr. A. L. Brittin, president Illinois State Medical Society, Athens.
3. "Uterine Hemorrhage, With Lantern Slide Demonstrations of Its Pathology." Dr. J. H. Stealy, Freeport.
4. "The Advantages of the Hospital in Small Cities, With Plans for Its Organization and Management." Dr. H. West, Woodstock.
5. "Some of the Rare Complications Following Laparotomy." Dr. F. C. Schurmeier, Elgin.
6. "Some Infections of the Head and Their Causes." Dr. J. S. Clark, Freeport.
7. "Diagnosis and Treatment of Septic Conditions in the Abdominal Cavity." Dr. J. E. Allaben, Rockford.
8. "Nervous Disorders in Relation to Public Health." Dr. S. D. Wilgus, Rockford.
9. "Twilight Sleep." Dr. A. L. Mann, Elgin.

Brief discussions followed some of the papers.

The visiting doctors gave a vote of thanks to the Winnebago County Medical Society for all courtesies shown at this meeting.

Personals

Dr. Normon H. Weston dislocated his right wrist and ankle in the Central Y. M. C. A. gymnasium, February 10.

Dr. William Healy, Winnetka, has passed the examination for director of the Juvenile Psycopathic Institute, Chicago, with the highest average.

Dr. Albert E. Mowry, who has been a member of the faculty of the Northwestern University Medical School for the past fifteen years, has been appointed Professor of Genito-Urinary Surgery and Venereal Diseases at the Chicago Hospital College of Medicine.

Dr. George F. Butler, Medical Director, Mudlavia, Kramer, Ind., will hold office hours in Chicago, 122 S. Michigan avenue, from 2 p. m. to 4 p. m., on the first and third Saturday in each month, for the accommodation of those desiring to consult him personally, or who wish special information concerning the Mudlavia treatment. Appointment may be made in advance by addressing Dr. Geo. F. Butler, Medical Director, Mudlavia, Kramer, Ind.

News Notes

—County Judge Scully has named the following advisory commission to assist in the hearing of lunacy cases in Cook County: Drs. Hugh T. Patrick, Peter Bassoe and Harry L. Pollock, Chicago.

—A new hospital to cost about $100,000 and to be known as the Concordia Evangelical-Lutheran Hospital, is to be erected on Haddon avenue, near Kedzie, where the trustees have acquired a tract 300 by 117 feet.

—Dr. Fred H. Albee of New York will address the Iowa and Illinois Central District Medical Association in an illustrated lecture on the evening of March 23, meeting to be held at Blackhawk Hotel in Davenport.

—The Fenger Fellowship of $600 for 1915 has been assigned to Dr. George L. Mathers of the resident staff of the Cook County Hospital, Chicago, who will carry on work on certain bacteriologic problems in pneumonia.

—Friends of Dr. Daniel A. K. Steele, dean of the Medical School of the University of Illinois, Chicago, gave a dinner in his honor, February 1, at the Hotel La Salle, at which about ninety were present. Dr Charles S. Bacon presided as toastmaster.

—McKendree College at Lebanon was closed earl yin February on account of the reappear-

ance of scarlet fever in the school. Two new cases were found. This is the second time within a month that the school has been closed on account of this disease.

—February 6 Decatur was placed under general quarantine by the State Board of Health on account of an epidemic of scarlet fever. It was reported that there were about 100 cases in the city and regulations were adopted as to visiting public places, violating quarantine rules, etc.

—The Freeport Academy of Medicine and Surgery was organized February 5, with an initial membership of 18 and the following officers were elected: President, Dr William B. Peck; vice-president, Dr. D. C. L. Mease: secretary, Dr. Theophil J. Holke; treasurer, Dr. Edgar J. Torey.

—A committee of medical men from the Winnebago County Medical Society of Rockford presented a petition to the mayor, January 30, signed by practically every member of the society, requesting him not to accept the resignation of Dr. Daniel Lichty, Rockford, from the board of the Tuberculosis Sanatorium.

—The Medical Society of the State of New York will hold its one hundred ninth annual meeting in Buffalo, April 27-29, 1915. Owing to the war this is expected to be one of the largest medical meetings of the year. Dr. Edward A. Sharp, 481 Franklin street, is chairman of the committee on registration and information.

—*The American Practitioner,* New York, has been purchased by the Urologic Publishing Association and consolidated with *The American Journal of Urology, Venereal and Sexual Diseases.* The consolidated journal will be under the editorship of Dr. William J. Robinson. The publication offices will be at 12 Mt. Morris Park, West, New York City.

—The authorities of Michael Reese Hospital announce, as the result of their experience after a series of about forty obstetric cases treated by the scopolamin-morphin anesthesia, the so-called "Twilight Sleep," that they will not use this method in labor except with the express guarantee of the patient that the hospital shall be free from all liability as regards ill results to the mother or the child.

—The office of the internal revenue collector in Chicago has been a busy place the past few weeks with physicians and druggists applying for licenses to comply with the new Harrison Anti-narcotic Law. It is supposed that a number of "dope fiends" have applied for licenses as physicians and druggists, and taken a risk of severe penalty to secure supplies. A membership card in a medical society is a very convenient means of identification.

—The warden of the State Penitentiary, Joliet, has called in consultation Drs. George A. Zeller, Peoria; Eugene G. Cohn, Hospital, and H. Douglas Singer, director of the State Psychopathic Institute, and George Ordahl, state psychologist, to start plans for the installation of a psychopathic institute in the penitentiary. The plan as outlined deals with the segregation of prisoners according to their mentality. The four most important things to be taken up in connection with every prisoner are heredity, eugenics, environment and opportunity in life.

—On April 3 an examination will be held at Anna, Carbondale, Chicago, Dunning, East St. Louis, Elgin, Jacksonville, Kankakee, Lincoln, Macomb, Mt. Vernon, Peoria, Pontiac, Springfield, Urbana and Watertown to provide an eligible list for the position of food bacteriologist in the Chicago office of the State Food Commission. The salary at present is fixed by law at $1,800 a year. The limits recommended by the State Civil Service Commission are $150 to $175 a month. The examination will be open to non-residents as well as residents of Illinois over 25 years of age. The duties of the position involve making bacteriological examinations (and interpreting the results of such examinations) of milk, ice cream, eggs, meat, tomato products, etc., in accordance with the dairy, food and sanitary laws.

—*The International Hospital Record,* which has been published for eighteen years by the Sutton Publishing Company, Detroit, has been purchased by the Modern Hospital Publishing Company of St. Louis and Chicago, and will be merged with *The Modern Hospital* beginning with the March issue. *The Modern Hospital* is a monthly magazine devoted to the building, equipment and management of hospitals, sanatoriums and kindred institutions. Recently it has opened several new departments relating to public health problems, such as "Philanthropy and the Public Health," "Prevention of Tuberculosis," "Prevention of Blindness," "Dispensary and

Out-Patient Work," and "Life Extension." The editorial offices of *The Modern Hospital* are located in Chicago and the publication offices in St. Louis.

Marriages

JOHN FERDINAND GOLDEN, M. D., to Miss Florence F. Lydon, both of Chicago, January 19.

MATHER PFEIFFENBERGER, M. D., to Ethel Hortense Rodgers, both of Alton, January 20, 1915.

Deaths

SAMUEL T. BALDRIDGE, M. D. State University of Iowa, Iowa City, 1887; a member of the Illinois State Medical Society; died at his home in Chicago, February 2, aged 52.

JOHN DAMASCUS BAMBENEK, M. D. Northwestern University Medical School, Chicago, 1908; died at his home in that city about January 7, from pneumonia, aged 33.

MONTAGUE J. JONES, M. D. Medical College of Ohio, Cincinnati, 1871; for several years a practitioner of Peoria; died at his home in Chicago, January 27, aged 74.

JOSEPHUS FOREMAN, M. D. Eclectic Medical Institute, Cincinnati, 1868; for many years a resident of Patterson, Ill.; died at his home in that place, December 24, aged 70.

JOHN CALVIN CRAIG, M. D. University of Michigan, Ann Arbor, 1873; of Liberty, Ill.; died in Conway, Ark., Dec. 14, 1914, from sarcoma of the jaw, following an operation, aged 66.

DIEDRICH A. BRUMUND, M. D. Northwestern University Medical School, Chicago, 1900; also a graduate in pharmacy; until three years ago a practitioner of Chicago; died suddenly at his home in St. Stephen, N. B., January 1, aged 40.

WILLIAM G. SCHMIDT, M. D. Missouri Medical College, St. Louis, 1891; a practitioner and druggist of Quincy, Ill.; died at his home, January 16, from disease of the liver, aged 54.

JOHN WEIR WIESTLING, M. D. University of Pennsylvania, Philadelphia, 1866; died at his home in Vandalia, Ill., January 19, from dropsy, aged 72.

CHARLES A. E. LESAGE, M. D. Northwestern University Medical School, Chicago, 1897; a Fellow of the American Medical Association; once president of the Dixon Medical Association and secretary of the Lee County Medical Society, and a specialist on diseases of the eye, ear, nose and throat, of Dixon, Ill.; a member of the staff of the Dixon Public Hospital; died at his home in that city, January 22, aged 42.

D'ORSAY HECHT, M. D. Northwestern University Medical School, 1898; associate professor of nervous and mental diseases in this college; attending neurologist Michael Reese, Wesley and other hospitals of Chicago; a Fellow of the American Medical Association; president of the Mississippi Valley Medical Association 1913-14; a member of various neurologic and psychologic societies; died suddenly at his home in Chicago, February 16, 1915, of angina pectoris, aged 41.

CHARLES WARREN JOHNSON, M. D. Jefferson Medical College, of Philadelphia, 1872; a practitioner for nearly thirty years of Litchfield, died at his home, January 23, 1915, of cerebral hemorrhage after a short illness. Dr. Johnson was born in Hong Kong, China, in 1848, where his parents were engaged in missionary work. His boyhood life and the first years of his medical career were spent in the New England states. He was for many years the health officer of his home city.

NEW AND NON-OFFICIAL REMEDIES.

During January the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion with New and Non-Official Remedies:

Hynson, Westcott & Co.: Glycotauro Capsules (half size).

Eli Lilly & Co.: Alcresta Ipecac Tablets.

Merck & Co.: Canathardin, Merck.

H. K. Mulford Co.: Luetin.

Canthardin: The anhydride of cantharidic acid preparations of cantharidin are used in place of corresponding preparations of cantharides and have the advantage of being cleanly and more uniform in strength. A 0.1 per cent. solution of cantharidin in a fixed oil raises blisters when kept in contact with the skin (Jour. A. M. A., Jan. 2, 1915, p. 53).

Benzene, Medicinal: A liquid consisting almost entirely of benzene, C_6H_6. Medicinal benzene has been used in the treatment of leukemia. In many cases the improvement is such as to suggest an apparent cure. A large number, if not all, cases relapse or succumb to the toxic action of the benzene. The drug is in the experimental stage and should be used with caution (Jan. A. M. A., Jan. 2, 1915, p. 54).

. Benzene, Merck, H. P. Crystallizable: A brand of medicinal benzene. Merck & Co., New York (Jour. A. M. A., Jan. 2, 1915, p. 54).

Leucocyte Extract: An extract of leucocytes obtained from exudates produced in the pleural cavity of rabbits or other animals. It is said to be of value as an aid to specific serums or antitoxins and vaccines. It is claimed to be of use itself where the nature of an infection is not known. Its use is in the experimental state (Jour. A. M. A., Jan. 2, 1915, p. 54).

Leucocyte Extract, Squibb.: A leucocyte extract prepared according to the method of Hiss. It is sold in syringes containing 10 c. c. E. R. Squibb & Sons, New York City (Jour. A. M. A., Jan. 2, 1915, p. 54).

Silver Citrate, Merck: A brand of silver citrate admitted to New and Non-Official Remedies. Merck & Co., New York (Jour. A. M. A., Jan. 2, 1915, p. 54).

Silver Lactate, Merck: A brand of silver lactate admitted to New and Non-Official Remedies. Merck & Co., New York (Jour. A. M. A., Jan. 2, 1915, p. 54).

Digitoxin, Merck: A brand of digitoxin admitted to New adn Non-Official Remedies. Mercy & Co., New York (Jour. A. M. A., Jan. 2, 1915, p. 54).

Luetin: An extract of the killed cultures of several strains of the *Treponema pallidum*, the causative agent of syphilis. It is employed for the diagnosis of syphilis. It is of use in the examination of tertiary cases, but rarely gives a positive reaction in primary cases or in untreated secondary cases. Luetin is supplied as:

Luetin, Mulford: Packages sufficient for a single test, for five tests and for fifty tests. The H. K. Mulford Co., Philadelphia (Jour. A. M. A., Jan. 23, 1915, p. 343).

Glycotauro Capsules (half size): Each capsule contains Glycotauro (see N. N. R.) 0.15 Gm. Hynson, Westcott & Co., Baltimore, Md. (Jour. A. M. A., Jan. 23, 1915, p. 353).

The closed window shuts out the pure life-giving air that you need to conserve your health and promote bodily health and vigor.

A clean skin means a healthy body. Soap and water with a coarse, rough towel, will do the trick.

In diphtheria, delay in the administration of antitoxin means death to the child. Moral, call your doctor early.

The old and oft-repeated saying, "A little knowledge is dangerous," is not wholly true; for even a little knowledge on health matters is better than complete ignorance. But no one should be content with just a little knowledge so long as there is opportunity to get more. Neither should we be puffed up with nor over-rate the little we have, but, as the advertising man says, "keep everlastingly at it" to get more.

It is the daily experience of medical health officers to find people who rebel against or chafe under the infliction of quarantine. In many cases, in most, perhaps, this opposition is due to ignorance as to the necessity for protecting those who are well from those who are sick with a contagious disease.

Then, too, in many such cases, there is a lack of due regard for the rights of others, an overlooking of the principle that we owe it to our neighbors to give to them the same protection that we have a right to expect or demand from them under the same circumstances. Here is an instance showing how contagion is spread:

A mother whose child had scarlet fever and whose home was under quarantine, violated the law by going to a department store where she purchased a coat on approval and took it home with her. A day or two later the garment was returned and was bought by a woman in a nearby town. Within five days her only child, a daughter, aged 5, came down with scarlet fever and ten days later died. This case was the starting point of an epidemic in that town which was not checked until there had been eighty cases and four deaths.

The above is only a sample of hundreds of similar cases that might be cited, as showing how contact of the well with the contagious sick means the spread of disease, suffering and death in a community.

An hour spent each morning working in the garden or caring for the lawn will put you in fine fettle for the day's work in the office. In fact, it is about the best "spring tonic" one can take.

"Most men eat far too much, and they would be far happier, far healthier and far more capable of resisting disease if they would eat less. A scientific study of foods would make it possible for a large proportion of the population getting small wages to save and accumulate some portions thereof."

In the light of recent events, this statement should prove helpful to those who are complaining about the high cost of living—*From Bulletin Chicago Department of Health.*

Book Notices

Obstetrical Nursing. A Manual for Nurses and Students and Practitioners of Medicine. By Charles Sumner Bacon, Ph. B., M. D., Professor of Obstetrics, University of Illinois and the Chicago Policlinic; Medical Director, Chicago Lying-In Hospital and Dispensary; Attending Obstetrician, University Chicago Policlinic, Henrotin, German and Evangelical Deaconess Hospitals. 12mo, 355 pages, illustrated with 123 engravings. Cloth, $2.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

This is one of the most useful books for nurses we have seen. Nearly every nurse at some time or other does some obstetrical nursing, and while the book is devoted mainly to the field of obstetrical

nursing, it contains much that should be read by every nurse who does private duty.

Dr. Bacon clearly indicates the difficulties encountered by the nurse in the private home, and how the nurse may meet them successfully. Too many nurses, recently from institutions, have unnecessary difficulties in the homes, and many of these are pointed out. The recently graduated physician will find much in this book that he has not had in his medical course, and will benefit from the reading. We recommend it highly to all nurses.

MODERN MEDICINE. Its Theory and Practice. In Original Contributions by American and Foreign Authors. Edited by Sir William Osler, Bart, M. D., F. R. S., Regius Professor of Medicine in Oxford University, England; formerly Professor of Medicine in Johns Hopkins University, Baltimore; in the University of Pennsylvania, Philadelphia, and in McGill University, Montreal; and Thomas McCrae, M. D., Professor of Medicine in the Jefferson Medical College, Philadelphia; Fellow of the Royal College of Physicians, London; formerly Associate Professor of Medicine in Johns Hopkins University, Baltimore. In five octavo volumes of about 1,000 pages each. Volume IV. Diseases of the Circulatory System; Diseases of the Blood; Diseases of the Lymphatic System; Diseases of the Ductless Glands; Vasomotor and Trophic Disorders. Just ready. Price per volume, cloth, $5.00 net; half morocco, $7.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

The fourth volume of this great work is just from the printers and its thousand pages are devoted to Diseases of the Circulatory System, Diseases of the Blodd, Diseases of the Lymphatic System, Diseases of the Ductless Glands, Vasomotor and Trophic Disorders.

The high standards of the work are maintained in this volume. The subjects are all treated exhaustively by the several authors, and Dr. Osler himself has contributed much to this volume. It of course conforms in size, style and mechanical make-up with the three preceding volumes.

We believe this voluminous work on scientific medicine is one which no practitioner can afford to do without, and no medical library is complete without it.

INFANT FEEDING, ITS PRINCIPLES AND PRACTICE. By F. L. Wachenheim, M. D., Attending Physician Sydenham Hospital and Mount Sinai Dispensary, New York City. 12mo, 340 pages. Cloth, $2.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

One of the most useful little books for the general practitioner we have seen is "Wachenheim's Infant Feeding." He presents facts as accepted by the leading pediatrists; and studiously keeps away from long-drawn-out theories. In addition to this his methods are practical. The book covers the field of infant feeding admirably well, yet is brief enough that anyone may have the time for its study. We recommend it to the profession.

DISEASES OF THE BRONCHI, LUNGS AND PLEURA. By Frederick T. Lord, M. D., Visiting Physician, Massachusetts General Hospital and Channing Home for Consumptives; Instructor in Clinical Medicine, Harvard Medical School. Octavo, 605 pages. Illustrated with 93 engravings and 3 colored plates, Cloth, $5.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

This work of Lord's on Diseases of the Bronchi, Lungs and Pleura is designed for a textbook on these subjects, and as such is an excellent work. The general practitioner will also be interested in the book because of its clearness of diagnosis in many of his troublesome cases.

The author has gleaned the literature of today and presents the facts in a clear and comprehensive manner. The etiology and pathology of each disease is presented fully and clearly. The use of the bronchoscope is fully explained and the indications for its use are stated. We recommend the work to the profession.

INFECTION, IMMUNITY, AND SPECIFIC THERAPY. A Practical Textbook of Infection, Immunity and Specific Therapy with special reference to immunologic technic. By John A. Kolmer, M. D., Dr. P. H., Instructor of Experimental Pathology, University of Pennsylvania, with an introduction by Allen J. Smith, M. D., Professor of Pathology, University of Pennsylvania. Octavo of 899 pages with 143 original illustrations, 43 in colors. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, $6.00 net; half morocco, $7.50 net.

When Jenner gave to the world immunity to smallpox he also gave to the world the beginning of the science of immunity. It now seems strange that so long a time elapsed between this work of Jenner and the real work of Koch, during which time Pasteur did the only notably work in immunology.

If the study of immunity did accomplish but little for several decades, it is now fast coming into its own. No phase of medicine is advancing with such wonderful strides, and this work of Kolmer is not only abreast of the times but also has collected much data on this wonderful field of medicine.

A large part of the book is given to the laboratory technique of immunization and is given with great attention to detail. The book is generously illustrated and this aids the work very materially. Many of the illustrations are in colors. The book is written principally as a text-book for students, but as we are all students in this realm of medicine, it is especially valuable to the practitioner. We recommend it as a part of the doctor's armamentarium.

A LABORATORY MANUAL AND TEXTBOOK OF EMBRYOLOGY. By Charles W. Prentiss, A.M., Ph. D., Professor of Microscopic Anatomy in the Northwestern University Medical School, Chicago. Octavo of 400 pages with 368 illustrations, many of them in colors. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, $3.75.

The work is as important to the medical student as any work on anatomy or physiology, and a thor-

ough study of embryology is necessary for the full understanding of either of the other subjects.

This work of Prentiss' is written especially as a laboratory manual and textbook and covers this field admirably. The text is clearly written and studies the individual from the origin of the germ cell to maturity. The illustrations are especially worthy of mention and make the study of the text much more simple. Every student of medicine should have this book and study it. We recommend it to the teacher of embryology.

STUDENTS' MANUAL OF GYNECOLOGY. By John Osborn Polak, M. Sc., M. D., F. A. C. S., Professor of Obstetrics and Gynecology, Long Island College Hospital; Professor of Obstetrics in the Dartmouth Medical School; Gynecologist to the Jewish Hospital; Consulting Gynecologist to the Bushwick, Coney Island, Deaconess' and Williamsburg Hospitals, Brooklyn, and the People's Hospital, New York; Fellow American Gynecological Society, etc. 12mo, 414 pages, illustrated with 100 engravings and 9 colored plates. Cloth, $3.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

This little book, while written primarily for the student, will be very useful for the general practitioner. The author does not discuss theories, but confines himself to the definitely established facts.

It is written in a very systematic manner and so arranged that the reader may digest it with the least time and effort.

Considerable emphasis is laid on diagnosis and treatment, and the important points have been italicized.

The busy practitioner will find it a valuable book with which to review the work of the day.

THE RED BOOK of Eye, Ear, Nose and Throat Specialists, containing the Names and Addresses of Medical Specialists in Diseases of the Eye, Ear, Nose and Throat for the United States and Canada, arranged according to States and Provinces—Ophthalmological and Oto-Laryngological Societies—Medical and Post Graduate Schools and Colleges—A Selected List of Books Pertaining to the Eye, Ear, Nose and Throat and Other Valuable Information. Also an Index to the Names in this book arranged alphabetically. First Edition. 1915. Price, $3.00. Published by Lionel Topaz, 35 North Dearborn street, Chicago, Ill.

CORNELL UNIVERSITY MEDICAL BULLETIN. Volume IV. Number 2. October, 1914. Studies from the Department of Neurology. Published by Cornell University, 477 First avenue, New York City.

THE PRACTICAL MEDICINE SERIES, comprising ten volumes on the year's progress in medicine and surgery, under the general editorial charge of Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School, and Roger I. Vaughan, Ph. B., M. D. Series 1914. *Obstetrics,* being Volume VII, edited by Joseph B. DeLee, A. M., M. D., with the collaboration of Herbert M. Stowe, M. D. Price, $1.35. *Materia Medica and Therapeutics. Preventive Medicine. Climatology,* Volume VIII, edited by George F. Butler, Ph. G., A. M., M. D., Henry B. Favill, A. B., M. D., Norman Bridge, A. M., M. D., Price, $1.50. *Nervous and Mental Diseases,* Volume X, edited by Hugh I. Patrick, M. D., and Peter Bassoe, M. D. Price, $1.35. Complete set, 10 volumes, $10.00.

These three volumes are a review of all the new things that have been done in medicine and surgery in the last year. The use of this series is one of the best methods for a rapid review of all the advances in all the branches of medicine and surgery. The separate volumes are edited by men who know how, and the standard set by the previous volumes has been faithfully kept up.

A TEXTBOOK OF DISEASES OF THE NOSE AND THROAT. By D. Braden Kyle, A. M., M. D., Professor of Laryngology and Rhinology, Jefferson Medical College, Philadelphia. Fifth edition. Thoroughly revised and enlarged. Octavo of 856 pages with 272 illustrations, 27 of them in colors. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, $4.50 net.

The fifth edition of this work indicates how it is received by the profession. It has been a favorite among medical students for many years. In its present form it deals extensively with Rhinology and Laryngology, and has brought hte study of these specialties down to the present.

The book presents the various topics in a very systematic manner, and goes into minute detail of the etiology and pathology of the various diseases. The author has been rather specific in his treatment and does not attempt to relieve all conditions by surgery. The book is a valuable one to students and general practitioners.

DIAGNOSTIC AND THERAPEUTIC TECHNIC. A Manual of Practical Procedures Employed in Diagnosis and Treatment. By Albert S. Morrow, M. D., Clinical Professor of Surgery, New York Polyclinic. Second edition. Thoroughly revised. Octavo of 834 pages, with 860 illustrations. Philadelphia and London: 1915. Cloth, $5.00 net; half morocco, $6.50 net.

The fact that a second edition of this work is published soon after the appearance of the first edition proves it to be an exceedingly popular work. It is the only work of its kind that the reviewer knows of that completely covers the field of diagnostic and therapeutic technic. It is profusely illustrated, which makes the subject matter easily understood.

It is a work that will often be consulted, containing many of the "small" things which are too often neglected in works on diagnosis or therapeutics.

A printer's error appears on page 619. Finger's ointment, 3 ounces of lanum being transposed into 30 c. c. metric system. One of the illustrations that would better have been left out is figure 170, showing vaccine blown out of a capillary tube with the mouth. However, barring these, one cannot do otherwise but recommend this unique work to the profession generally.